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NEWSPAPER

CW News Update

Ohio Court Upholds Recordkeeping Plan

PARMA, Ohio – The Ohio Supreme Court has ruled that Walter Shipka, clerk of the Parma Municipal Court, has the right to continue automating court records in spite of the opposition of two Parma municipal court judges.

The decision hinged on whether Ohio law allows municipal court judges to supervise the operations of their elected court clerks.

Judges George Spanagel and Gertrude Polcar had filed a court order a year ago to halt Shipka's two-year-old program, which included a criminal disposition docket; an alphabetical listing of cases; open warrants, listed alphabetically and geographically; and other systems.

The two judges specifically charged that Shipka had failed to maintain parallel manual records of criminal dispositions even though the computerized version had not yet received approval as the official record.

But Shipka took the judges to court on the issue and won the right to continue with his automated program.

The judge in the case found that Shipka's program benefited the court, but told Shipka to keep his manual records up-to-date until the computerized system becomes functional.

The two Parma judges appealed, but the Ohio Supreme Court's ruling affirmed the lower court's decision.

Ford Signs Privacy Bill

VAIL, Colo. – The U.S. now has its first law governing the collection, use and dissemination of records in federal data banks.

President Gerald Ford, in keeping with his long-standing interest in the privacy question, signed the recently passed measure here on New Year's day [CW, Dec. 25-Jan. 1].

The bill not only covers data banks in the federal sector, but also establishes a privacy commission to review the operation of the current law and to study the need for legislation in the private sector.

On the Inside This Week

User Finds Work Divided Is Easily Conquered

By Patrick Ward
Of the CW Staff

COLUMBUS, Ohio – A manufacturing firm here found that splitting its production and inventory control workload between a mini and medium-sized computer is more effective and less costly than relying on a single "maxicomputer" to handle the task.

The company, Industrial Nucleonics Corp., makes process control systems, which can be a highly complex product from a producing-and-stocking standpoint. Customers expect 60- to 90-day delivery of systems, even though each is custom built to meet application requirements.

Management began to investigate better ways of planning production and handling inventory in 1971. The company then was using the Bomp program on an IBM 360/40 to maintain product structure and a card-ledger method of maintaining inventory status.

Three steps were taken early in the investigation.

- A project team, with the production and inventory control manager as its full-time leader, was established. Because the impact of the project would be felt throughout the company, the team included top management and representatives of sales, engineering, accounting and manufacturing.
- The company hired George W. Plossl, Inc. as a production and inventory control consultant.
- A search was launched to determine whether an outside supplier could provide an adequate system. Although Industrial Nucleonics itself is a developer of computer-based systems,

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Miniworld

'Grossly Unfair': Adapso

DP Materials Classified as 'Letters'

By Don Leavitt
Of the CW Staff

MONTVALE, N.J. – A Post Office regulation that classifies data processing materials as "letters" is grossly unfair to commercial data processing firms, truckers, messengers, other delivery companies and, ultimately, to the end users of the DP output, the Association of Data Processing Service Organizations (Adapso) charged late last month.

The regulation, which went into effect Oct. 20, encompasses "materials of all types that are ready for immediate data processing or for automatic conversion into a form ready for immediate data processing, and the direct output of data processing."

By defining such materials as "letters," the Post Office has, in effect, claimed an exclusive right to transport them, under terms of the U.S. Constitution. The regulation suspends the letter classificiation, however, under certain conditions.

To avoid the "letter" classification, the transmission of DP materials between the data center and its customer must be completed within 12 hours or by noon of the next business day. And the data processing must begin within 36 hours after delivery to the data servicing center.

The regulation allows users to work with whatever delivery system they now have without any extra cost as long as the time limits are met. But apparently it will be the responsibility of the users to prove – shipment by shipment – that the deadlines are met.

In a letter to Postmaster General Elmer T. Klassen, Adapso's executive vice-president Jerome L. Dreyer noted that "if the independent carriers, including airlines, truckers and messenger services used by the data processing service firms do not deliver the materials within the imposed time limits, the firms must pay postage to the Postal Service as though they had actually used the mails."

Adapso finds the new rulings objectionable on several grounds, Dreyer con-

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White Collar Union Growth May Reflect DP Interest

By Patrick Ward
Of the CW Staff

It is difficult to gauge whether DP workers are tending to unionize. When they do join a union, they do so in a block with other white collar workers, so unions can't really pinpoint how many of their members work in DP centers.

But major unions are reporting a sharp rise in their white collar membership and expect that these figures include rising numbers of data entry workers, computer operators and programmers.

White collar enrollment in the United Auto Workers (UAW) was three times higher in 1974 than in 1973, according to Hubert Emerich, head of the UAW's Technical, Office and Professional Organizing Department.

Growing white collar enrollment has probably been the main factor in the rise of Teamsters' membership from 1.8 million to 2.2 million between 1972 and 1974, research director Norman Weintraub stated.

However, the Communications Workers of America have noted steady, but not startling, growth in white collar enrolment, a union spokesman said.

DP workers vote to join unions because of concern about pay, job security and fringe benefits, union officials agreed.

Changes such as acquisition of the company by an outside firm or a plan to consolidate DP operations can set the stage for unionization, UAW's Emerich said.

"Computer people, along with other white collar people, resist change," he noted. "They fear that the home office computer center will be doing [their DP tasks] via transmission lines and that their center will be obsolete.

"We can't prevent progress, but we can insist that people be trained to take other jobs, that their seniority be honored, and

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Enacting Privacy Legislation Means Playing 'Political Game'

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – State legislators who tried to enact privacy laws last year failed because they didn't understand "the politics of privacy," said lame duck California Assemblyman William Bagley.

Speaking to participants of the recent privacy conference here, hosted by the Domestic Council Committee on the Right of Privacy and the Council of State Governments, Bagley said the public is painfully aware of the power of the computer – its "de-personalization of the information process and its seeming accuracy.

"You've got to give the public the idea that somebody is watching the computer," he said.

A privacy law that helps personalize the computer by letting people know "where the computer is, what's in it and who's in charge" should be your objective, he advised.

Noting that the politics of privacy demand a careful strategy, Bagley told participants the first step would be to get a legislative resolution to set up a standing committee to study the subject and begin to build a constituency. "Then get yourself a good author and draft the bill," he said.

As for a bill, there are limitations on what will pass. "You can't solve all the problems at once, so don't try to take on the whole world, because it won't work," he cautioned.

Reflecting on his unsuccessful experience with privacy legislation in California, Bagley noted that "we took on the public sector, and the whole private sector, too.

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Work Divided More Easily Conquered

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it recognized the high costs associated with system development.

The search revealed several software packages available, any of which could be used as a start to solving the problems. All, however, would require considerable effort to give the company the inventory control and production planning tools it wanted.

So the company decided to computerize inventory recordkeeping and to implement a material requirements planning (MRP) system using IBM Production and Inventory Control Systems (Pics) modules as a base.

In implementing its new MRP system, the company completely changed its way of ordering purchased parts, shop parts and assemblies. This new method required that parts and assemblies be categorized into logical groups and that they gradually be phased into the revamped method of ordering. The changeover was completed in June 1973.

But the company encountered some major difficulties with its newly computerized inventory control system (ICS). These included lag time between occurrence of a change in inventory and distribution of the batch report reporting on the change, priority conflicts at the data processing center and data preparation inaccuracies which came about because of keypunch operator unfamiliarity with manufacturing terms and requirements.

The company considered an on-line system as a solution to the time-lag problem. However, "the cost and upheaval of going on-line with IBM terminals, directly into the IBM 370/135 could not be justified."

An alternate approach, using the IBM System/7 or System/3 as a front-end processor, was also ruled out, since sufficient application software was unavailable at that time, and those models were considered incapable of handling the necessary volume of transactions and the file edit required.

Move to a Mini

Next, minicomputers were evaluated. Although minis did not offer the necessary software, some did have the data processing size and speed required.

Industrial Nucleonics decided to go with the Digital Equipment Corp. (DEC) PDP-11/40 as a stand-alone manufacturing computer and to update the mainframe files weekly by use of a compatible magnetic tape.

The system now in use at the company's Columbus facility is based on a PDP-11/40 CPU with 72K of core. Standard DEC peripherals include two disk drives of 40M characters each, a 300 line/min printer, a tape drive, one ASR teletypewriter and seven CRT terminals.

While conversion from batch-oriented data entry and reporting required considerable planning and training, the actual physical changeover took a weekend in April 1974. The inventory and order files were loaded from the mainframe into the mini and tested.

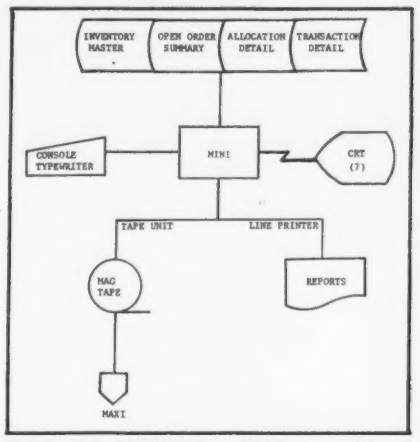
Since then, all data entry has been done through the mini's on-line terminals – with edit and logic checks so that errors can be corrected before information is entered into the data base. For example, such logic checks as verifying the existence of a purchase order and the validity of the amount to be received can be made against the files affected.

On-line entry of normal data is handled by regular production control clerks who were trained for the task. Entry of exception data, such as a scrap replacement issue at the stockroom window, is performed on-line by the personnel directly involved.

This is one of the most desirable features of the new minicomputer system. It is operated in a manufacturing environment and, from an operations perspective, by other than DP personnel. In fact, manufacturing people are responsible for running the system and, consequently, for the accuracy of the information that they use.

In day-to-day operation, the system produces nightly batch reports for action and summary items.

And once a week, a magnetic tape, prepared by the minicomputer system, and containing all changes in part and order status that have occurred during the week, is run on the maxicomputer to update the materials requirement plan.



Industrial Nucleonics divides workload between mini and larger computer.

On-line production floor control of inventory, scheduling, and order status – with inputs edited at the mini level – has increased accuracy of the data base and sped reaction to manufacturing changes.

The availability of needed parts and assemblies, one of the prime improvement objectives when Industrial Nucleonics began its investigation into controlling production and inventory, has substantially improved. One indication is the higher service level obtained since the new system has been in use.

Another is the 80% reduction in number of backordered items. This, in view of fluctuations in purchase lead-time which have occurred throughout industry during the past year, is particularly outstanding, the company observed.

Placing the ICS on the minicomputer has not only provided faster response, it has reduced the manufacturing-related computer costs of the company. The differential, before and after the April move to the mini, is approximately $10,000 per month, the firm said.

A company spokesman said Industrial Nucleonics had invested about 25 man-years of programming time in developing the software for its mini/maxi system.

Industrial Nucleonics Accuray Information Systems Division used the software in developing its Accuray 3000 manufacturing control system.

Post Office Classifies DP Materials as Letters

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tinued. "The regulation allows for revocation of the time guidelines at any time [in which case the materials] will be classed as 'letters' regardless of delivery or processing times.

"In that event," Dreyer said, the firms might still prefer the independent carrier for dependability, "but would have to pay both the carrier and the Postal Service. It is grossly unfair to demand either of these options.

"First, the time-sensitive nature of data processing materials makes it impossible for data processing firms to trust the documents to the well-known irregularities of the U.S. Mail. Independent carriers . . . have historically been faster and more reliable than the mail," Dreyer told the postmaster general.

The option of using a private carrier and paying both the carrier and postal service, is equally objectionable to Adapso. "Firms should not be expected to pay . . . for a service not rendered. This option is obviously a hidden tax, collected but not earned by the Postal Service," Dreyer charged.

In addition, Dreyer said, "the massive recordkeeping burden on the data processing firms to record the 36-hour processing limit and the carriers to monitor the 12-hour delivery deadline is extremely costly, cumbersome and antiproductive. At the same time, the Postal Service will have to spend millions of dollars to inspect the daily operations of the many carriers and data processing firms."

Summing up, Dreyer asked Klassen to rescind the order.

Explaining the two-month gap between when the regulation went into effect and when he wrote the postmaster general, Dreyer said that as far as he could determine there had been no particular effort by the Postal Service to publicize the new ruling, and Adapso had only become aware of it in late November.

He said if Adapso had known about it earlier, he certainly would have raised the same objections. "The is a rebirth of a plan first proposed in 1967 or '68. We didn't like it then and we thought we'd seen the last of it. But now it has reappeared without warning."

Although Adapso hasn't had any response from Klassen, a spokeswoman at the Postal Service challenged Dreyer's contention that there had been no publicity about the regulation before it went into effect. It was listed in the Federal Register either 60 or 90 days before it became effective, she said, and "many articles" about it were published in such generally circulated newspapers as the *Wall Street Journal.*

Privacy Act Sponsors Must Play Politics

(Continued from Page 1)

And we got opposition from everybody," he said.

At the top of Bagley's opposition list was the Department of Transportation, which objected on the grounds that, under Bagley's bill, it would have to send out thousands of notices to owners of motor vehicles.

The California University system was next, complaining that "we had failed to take into account their unique educational function." The Justice Department also objected because "as a matter of public policy, criminal justice should not be subject to such restrictions. Everybody thought they were a unique case and should be exempt from the law," he quipped.

Pointing out that in a democratic society, getting a consensus is slow work, Bagley emphasized the need to fight the battle a little at a time, "starting with a simple statement of intent and a code of fair information ethics.

CW Photo by N. French

Bagley

"Provide for the annual registration for computer systems by subject area through your Department of Consumer Affairs, and keep things like audit trails and linkage protection to a minimum so your opponents cost arguments won't kill your bill," Bagley said.

Prevents 'Spoiled' Supplies

Stock Delivery Plan Eases Holiday Blood Shortage

By Edith Holmes
Of the CW Staff

NEW YORK – By delivering fixed amounts of blood for transfusions to hospitals here on scheduled days and making supplementary deliveries when an emergency required them, a blood center helped ease the annual holiday shortage in the New York area and suggested a means for improving similar distributions around the country.

Keeping computerized track of the blood inventories at its participating hospitals, the New York Blood Center eased the demand for blood primarily by preventing hospitals from hoarding this resource, according to Dr. Eric Brodheim, an investigator at the center and an adjunct associate professor at Columbia University's School of Engineering and Applied Science.

Not only did careful management of available blood make conditions from hospital to hospital more equitable, but much less blood spoiled or "outdated" in inventory stockpiles, he said.

In addition, the system has cut deliveries over the last 18 months from an average of nine per week to the present 3-1/2 per week at some hospitals, thereby reducing costs and making more efficient use of the center's personnel.

Developed manually, the allocation system is being programmed as it is perfected for execution on an IBM 1130. "Right now we're writing programs for control procedures," Brodheim remarked.

He said the center hopes eventually to replaced the 1130 with a machine capable of on-line operation – "something on the order of a PDP-11/45."

Working with Prof. Cyrus Derman of Columbia's Engineering School, Brodheim commented that the program began with an analysis of past blood inventories in order to predict patterns of demand, followed by a determination of the necessary levels of hospital inventories and the best schedules for delivery.

Because blood "outdates" after 21 days, regional blood agencies, which supply most American hospitals, must provide enough blood of all eight types to meet any emergency, yet not so much that reserve blood spoils before it is used. Brodheim noted that he and Derman found daily needs vary widely at each hospital, further complicating inventory control.

Prior to the allocation system, there were no schedules. Hospitals simply called their blood center whenever they needed blood. Not only did this force the center to make costly deliveries, but "bunching occurred at certain hours, because hospitals all tended to order blood at the same time – for example, for surgery every morning.

"The new system assures participating hospitals a definite, though reduced, supply during shortages and tries to fill any other critical needs as they arise," Brodheim said. He expects that hospitals will plan to delay such activities as "elective" surgery, so the demand for blood will slacken during these periods.

The researchers also hope to reduce outdating from a high of 20% to 30% of the inventory of some hospitals to a low of 1% to 3%, a percentage already attained by those institutions making a conscious effort to solve this problem, according to Brodheim.

The center presently helps hospitals keep track of potential sources of waste by taking verbal inventories every one or two weeks, depending on the size of the institution, and entering this information into the computer system. Brodheim explained that the use of machine readable labels on blood products and a modified point-of-sale system could automate the data gathering involved in maintaining hospitals' blood inventories.

Over half of Long Island's 40 hospitals were covered by the plan as of Dec. 31, and the remainder are expected to join sometime this year, he noted. In addition, five New York City hospitals are participating in the program.

Funded by the National Heart and Lung Institute, the research project at the blood center is being conducted in collaboration with The Greater New York Blood Program. The blood center has also helped design an experimental program for Miami and Dade County in Florida and has analyzed the needs of parts of Rochester, N.Y., and parts of Michigan, according to Brodheim.

Unions See Growth In DP Membership

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so on," Emerich added.

Recession, in particular, makes workers wonder about their job security and plays a part in growing white collar membership, the union officials mentioned.

While there is still some question about whether programmers or even computer operators can properly be grouped in a white collar union, keypunch operators definitely qualify as office/clerical employees, Emerich said.

However, "given halfway decent working conditions and a halfway decent salary," workers aren't inclined to join a union, Emerich commented. Workers need some motivation, since joining the union would be a change from the environment they're used to.

"We can't provide the motivation," Emerich said. "The only one who can motivate them is the employer."

Data Banks Get Data Bank

URBANA, Ill. A grant from the National Science Foundation and the determination of a University of Illinois computer information expert has kicked off the complex project of developing a "data bank of data banks."

The $100,300 grant will make it possible for Prof. Martha E. Williams, director of the information retrieval research program at the university's Urbana-Champaign campus, to index all of the estimated 12 million to 20 million bibliographic information items stored in 150 data banks around the world.

"The individual often doesn't know where to go, doesn't know which data bank to use, to find out what he needs," she said.

The data bank will index all publicly available, machine readable bibliographic information on all scholarly subjects, Williams said.

Fire Station Locator May Save City Time, Money

By Patrick Ward
Of the CW Staff

FORT COLLINS, Colo. – A computer program may help this city's fire department both cut its costs and improve its response times to emergencies anywhere in the city.

Fire department officials have been using the Fire Station Location Package from Public Technology, Inc. (PTI) to determine the optimum places in Fort Collins for fire stations to be located.

Results so far show that two of the city's three stations should be moved to other sites. If this is done, according to the program, Fort Collins won't need a fourth station until 1978 and won't need a fifth one for at least another decade.

The city could save between $375,000 and $420,000 in the next three years by relocating the existing stations rather than building and staffing a fourth one, said Assistant City Manager Michael DiTullio.

And Fire Prevention Bureau Chief Donald Hisam noted that relocating the two stations would give the city a better response time to fires than would building a fourth station.

Hisam added that the computer shows that if the two stations are moved and a fourth one built on an optimum site, the four stations would provide the city with better coverage than six stations.

And the study shows that payroll cost savings could amount to $1.2 million in 10 years if relocation of two stations allows delaying the addition of a fourth for three years and of a fifth station for at least 10 years.

'Objective Data'

The Fire Station Location Program is unique in that it allows the city "to really put some objective kinds of data together" on where to locate fire stations most effectively, DiTullio commented.

Fort Collins and PTI measured the distance between adjacent intersections on city streets and then estimated the speed a fire truck could travel that distance, either by noting the category of street or by actually running a truck through the street.

The worksheets on city streets were keypunched by PTI and run on that company's time-shared IBM 360/65 in Washington, D.C., said Joseph Thomas, PTI's technical representative for the project.

If the Fort Collins City Council does decide to move some of its fire crews to better placed stations, the old fire stations won't go to waste, DiTullio remarked.

He said Fort Collins has plans to turn them into neighborhood recreation centers.

Service Aids Local Governments

WASHINGTON, D.C. – The Fire Station Location Package is one of several computer programs and services available to cities, counties and state governments from Public Technology, Inc. (PTI).

Local governments, primarily cities, subscribe to PTI for between $1,500- and $50,000/year, based on population levels, noted Joseph Thomas, who is a PTI technical representative. In return, PTI can supply computer programs, seminars and technical assistance, Thomas said.

Thomas described PTI as "a research and development organization designed to promote transfer of existing technology into cities, counties and states." It either modifies existing technology to solve problems reported by governmental users or develops its own, he noted.

Among the existing PTI systems is a program to calculate a replacement cycle for municipal vehicles.

In addition, a public facility locator program is under development. This system is a variation of the Fire Station Location Package, but uses appropriate criteria to help cities locate parks, libraries, ambulance stations and public works garages.

A refuse vehicle districting program and a city equipment management system are also under test.

PTI will provide several levels of documentation to a client, with perhaps one designed for the city's mayor, another for the department that is affected and a third set for the city DP department, Thomas said.

This multifaceted documentation also characterizes PTI's Orientation and Training Package for Computer Usage, which involves PTI-run seminars, plus documents, flip charts and slides that are all intended to familiarize local government with computers.

"We come in and explain what a computer could be used for and get people thinking" about how DP could answer user departments' needs, Thomas said.

A forthcoming manual on systems analysis and another on managing a large system development project are part of this effort, he added.

Although PTI itself time-shares on an IBM 360/65, its programs have been adapted to run on a variety of user mainframes. "If the city has a machine we haven't run before, PTI and the city's staff will work together to adapt the program" to the mainframe, Thomas said. Both PTI and the user retain copies of the program documentation.

PTI is at 1140 Connecticut Ave., N.W., 20036.

World Medical Research File to Go On-Line

By Edith Holmes
Of the CW Staff

ROCKVILLE, Md. – A computer system designed to link medical researchers, doctors and other health professionals in North America with a file on medical literature in Amsterdam has been developed and will be marketed in early 1975 by Informatics, Inc.

Officially available as of Feb. 15, the system permits users to access a data base containing some 20,000 yearly issues of 3,500 journals from all over the world via a wide variety of common remote terminals, according to Molly Wolf, director of biomedical information services for Informatics.

Called Excerpta Medica On-Line, the system depends on the Excerpta Medica data base created by the foundation of the same name and an IBM 370/158 belonging to Informatics, she noted.

Coverage of biomedical literature on the basic medical sciences and clinical specialties has resulted in a data base with 40 sections ranging from topics like cancer, epilepsy and cardiovascular disease to pharmacology, toxicology and many others, Wolf said.

The data base itself consists of:

- A computerized medical thesaurus containing 180,000 preferred terms and 360,000 synonyms.
- A conversion table used to convert preferred term numbers to the alphabetical form for free text searching.
- A classification system, allowing up to 10,000 subdivisions of each major section of the data base.
- The Wiswesser Line Notation to provide the least ambiguous representation of chemical structure.
- The biomedical source data itself, consisting of approximately 500,000 abstracts of the 20,000 individual journals scanned by medical and research specialists at Excerpta Medica.

Wolf commented that her company plans to provide on-line network access to the data base through its own time-sharing network and to use other networks for on-line interactive literature search and retrieval.

Since mid-December, the company has had a user steering committee composed of 10 institutions from various fields using the system free of charge. "What we are really conducting is a product acceptance test among representatives from drug, pharmaceutical and chemical companies, government, biomedical libraries, research hospitals and medical associations," she remarked.

With 180,000 citations on file now, the data base will grow by 50,000 to 60,000 entries per month beginning in February, she said. Until completed for the current year, the system will cost users $90 per connect hour to the data base, plus network and-off-line printing charges and a training initiation fee.

Once the system contains one-half to one million citations, "we will charge on some kind of subscription or per search basis as yet undefined," Wolf noted.

Further information concerning the biomedical information system may be obtained from the firm through Wolf at 6000 Executive Blvd., 20852.

ABA Begins Job Search Program

CHICAGO – A recent surge in law school enrollment and record breaking numbers of persons admitted to the bar has created a critical employment situation and has spawned the formation of a computer job search system for the legal profession.

The American Bar Association's Law Student Division is sponsoring the computer program to ease the employment burden from the shoulders of both students and employers.

Slated to be operational in early 1975, the system uses coded information on qualifications and preferences supplied by students and employers to make a "match."

"Matches" are based on students' descriptive attributes such as "courses taken" and "additional skills and experience," and employers' specialized needs.

Need for the system is underscored by the 160,000 now enrolled in law school, and the 30,879 graduates admitted to the bar last year alone, according to David W. Erdman, president of the Law Student Division.

"Balance this against a U.S. Department of Labor estimate that only 16,500 legal jobs will be available each year until 1980 and you can see how critical the employment situation is for the graduating law student," Erdman said.

Integrated Training Essential For Proper Use of 'Peopleware'

By Edith Holmes
Of the CW Staff

WELLESLEY, Mass. – "Companies spend millions on hardware, software and their maintenance, yet commit little management support and funding to the development and maintenance of their most expensive DP resource, their 'peopleware,' " a DP professional and developer of a "disciplined approach" to the training of data processors said in a recent interview here.

Professional Development

"The essential need is for a proven methodology that integrates job responsibilities, career path planning and systems development procedures with the formulation of an effective training program and plan," Lawrence K. Grodman, president of Q.E.D. Information Sciences, Inc., explained.

While hardware and software monitors and systems simulators are used to measure and optimize efficiency at a facility, the personnel side of data processing "rarely receives meaningful policy and planning attention," he noted.

What planning many DPers do, when faced with increased corporate demands and other external pressures, is more suited to short-term rather than long-term contingencies, Grodman added.

"They often substitute additional or faster hardware, expensive software packages and more personnel in place of improved utilization of existing equipment, attention to work flow and better managment of resident resources," he said.

While recognizing training as one of several factors to consider when developing "peopleware," Grodman contended proper planning for training is a major element in efficiently managing the DP professional. He also emphasized the importance of viewing training as "closely related to factors such as career progression, job definition, organizational objectives and operating procedures."

Accordingly, before developing a training curriculum tailored to its needs, a DP organization must first determine its relationship to user departments, its internal distribution of responsibilities and accountabilities and its line and project management needs, he said.

The next step involves an analysis of the tasks and skills required of each job and the definition of job classifications within the several components of the DP function, accoridng to Grodman. The resident skills of the existing DP staff must be identified, followed by the establishment of a set of position descriptions that should be both complete and current, he added.

Position descriptions "should summarize the responsibilities and tasks, list specific authorities and delineate the skills requirements of each job classification.

"These are essential for manpower planning, interviewing and performance evaluation and represent a link between job responsibilities and training," he indicated.

"Once the DP organization, its relation to the company and its component job classifications and grade levels are clearly understood, it is possible to generate meaningful and achievable career path ladders," Grodman said. "These should outline career opportunities both within and outside the DP function, and should provide for technical as well as managerial development.

With all of these tasks performed, the DP organization is then in a position to

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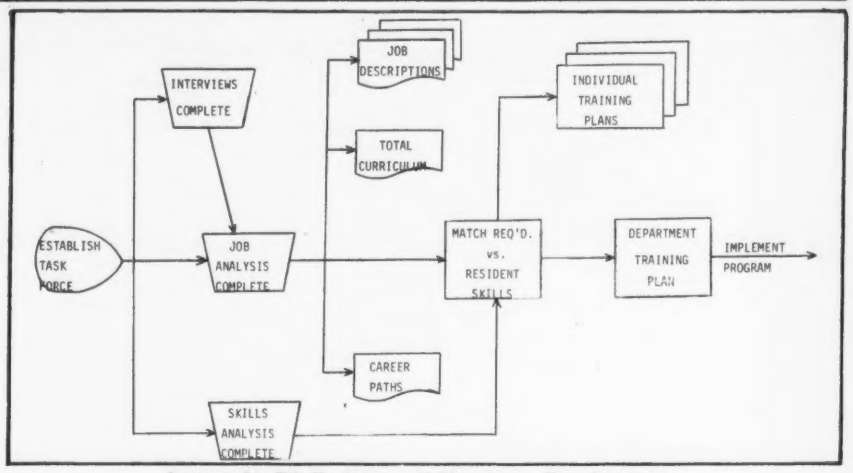

System for DP Training and Manpower Development

Seminar to Discuss TP Analysis, Design

NEW YORK – An advanced course on Teleprocessing Systems Analysis and Design will be given here Jan. 27-29, under the auspices of *Computerworld*'s EDP Seminar Series and the ICC Institute (ICCI).

A follow-on to the two-day course on "Data Communications: The Executive Imperative," this more advanced seminar has been given in Canada and Europe, but this will be the first offering in the U.S., according to Ian Seidler, director of ICCI.

With emphasis on problem-solving techniques for minimizing operation costs, the seminar will be "especially timely in these times of upward pressures on network expenditures," Seidler commented.

Attendees will actively participate in group case studies and present their unique problems to the course faculty.

The faculty will consist of Dr. Dixon Doll, an independent data communications consultant, and members of the ICCI technical staff.

Besides customized course materials, a primary technical aid will be James Martin's *Systems Analysis for Data Transmission*, all included in the course fee of $450 for the first attendee in a company and $400 for additional attendees.

Further information is available from CW, 797 Washington St., Newton, Mass. 02160.

Program Combines Knowledge of Tax, DP Specialists

By Edith Holmes
Of the CW Staff

EL SEGUNDO, Calif. – In an effort to teach its tax specialists a little "DP-ese" and its DP people something about tax, a company handling automated tax returns has conducted a basic course to combine the two fields.

"While attempting to build teams of tax specialists and data processors, we found our tax people didn't understand what the DP department was doing, and vice versa," Phyllis M. Lisby, training consultant for Computax Corp., commented. "We decided we needed to teach these people about their respective specialties so they could talk to each other more effectively."

Professional Development

Headquartered here with processing centers in seven major cities in the U.S., Computax completes city, state and federal income tax returns for individuals, and fiduciary work for partnerships and corporations through certified public accountants acting on their behalf.

Using course modules developed by Edutronics Systems International, Inc. as a nucleus, Nisby and her staff of technical specialists developed a program with emphasis on programming principles, beginning and intermediate Cobol, OS/VS and JCL.

Though not exclusively oriented toward DP, the course centered on DP because "our tax analysts were at a somewhat greater disadvantage in understanding technical aspects of this field than were the DP people who processed tax information," she said.

Some 90 to 100 Computax employees went through the course, held in multiple sessions from February to September. Nisby noted that people were permitted to filter in and out to attend specific courses as their needs dictated.

For example, she said some data processors only attended the section on JCL as a refresher course, while other employees went through the entire six-week program.

Presented a total of three times, the program was conducted five days a week and had two separate training groups, one in the morning and the other in the afternoon.

Assigned to each subject as teachers, technical specialists tailored Edutronics' materials to the tax orientation of the company, according to Nisby. She explained that they used the audio-visual vendor's 8mm continuous loop films and workbooks as an introduction to the subject, and then went beyond this information to relate the topic to specific Computax applications.

A separate training office was available to students who wished to repeat modules in auto-tutorial fashion, either to reinforce what had been learned in class or to make up a missed class, Nisby remarked.

Finally, students were aware of each course subject's objectives at its outset. She noted that written tests were used to assure that these objectives were met.

Asked to submit detailed critiques for each course subject, students generally responded favorably to "this broad-brush approach to data processing," Nisby said. Students more experienced in DP tended to feel technical areas were treated too shallowly, while those who hadn't dealt with computers before occasionally felt the courses moved too quickly.

"As in any educational effort, we had a little trouble underchallenging some people and overchallenging others," she commented. "But the fact that our tax and DP personnel seem to be doing a better job of communicating indicates that our overview of DP achieved what we wanted it to."

Nisby said the lead time required to develop the course was three months. Normally, she works around the heavy tax season, spending from October to February or March devising training programs to meet the company's current needs and from mid-February through September coordinating the training effort for that year.

At present she's using an Edutronics module on CICS as the basis for a course in that subject during 1975. Six software specialists are currently taking this course.

Too small to purchase Edutronics' courses outright, Computax leases modules on a monthly basis, according to Nisby. In addition, the firm sends its people to various vendor courses which provide the best alternative for fulfilling its needs.

Don't Forget 'Peopleware'

(Continued from Page 5)

develop a training curriculum tailored to its needs. Grodman suggested that the curriculum include media, in-house workshops, public courses and other programs "as the numbers of people and priorities dictate."

He also urged the establishment of a plan for implementing training – a plan defining high-priority problems requiring training and specifying the necessary budget and required resources. Grodman considered it essential that "DP training be put on a sound business basis."

Like all computer-related activities, training and professional development should be integral parts of systems development, he emphasized.

"Recruiting and selecting employees are only the *intial* stages in building a capable team," Grodman said. "DP professionals require *ongoing development* if their potential is to be fully realized."

"In addition to specific responsibilities and knowledge requirements, job descriptions should contain such elements as administrative duties, promotion to/promotion from information, experience and formal education requirements and day-to-day contacts," he said.

A career path progression chart (CPPC) is another tool that can be used to indicate growth opportunities both within and outside the DP department, Grodman noted.

The third output, an overview of the curriculum required, includes a list of course modules, touching on such basic areas as technical subjects, management techniques, human communication skills and the business of the client.

By matching required and resident skills, specific training plans can be generated for each individual in the organization. "In effect, each individual is assigned a specific subset of the total DP curriculum, depending upon his or her experience, resident skills and job responsibilities," Grodman said.

Finally, a "plan of action for professional development" – the "department training plan" is drawn up detailing the design and implementation of the DP training program.

"Based on all the information previously gathered, it specifies proposed budgets, resources (both manpower and equipment), priorities, recordkeeping procedures and maintenance procedures," Grodman said.

DP-Based Health Care Crucial, Canadian Science Council Warns

By T.M. Whiteman
Special to Computerworld

OTTAWA, Ont. – If the full benefits of progress in the biomedical field are to become generally available in this country, top priority must go to the careful use of computer information systems coupled with modern data communications in the health care field.

This is one of the recommendations of a recently completed research report of the Science Council of Canada, which investigated how science and technology can assist in the search for solutions to the problem of improving the delivery of health care as a socially supported service.

The full use of the technology of information systems is recommended to make the country's $6.6 billion annual health-care expenditures more effective.

"We regard the general use of computer-based information processing in health care systems inevitable," the report noted, "and the development of health information systems (HIS) is an essential component of the application of computers to help solve the operational and research problems of health care in Canada."

The report recommends that the satisfactory evolution of the health care system will require the development of computer-based health information systems "and this work must be funded on a long-term basis or the effort will be wasted."

An important aspect of HIS is the need to use standardized record formats and terminology. While the council favors a plurality of approaches, continuous cooperation among groups working in this field will have to be ensured to avoid the development of a number of incompatible systems.

The council said that, for many purposes, "interprovincial compatibility of records" is as important as compatibility within systems in one province.

"The development of standardized health care records is a prerequisite of a computer-based HIS and has to receive first priority in the HIS program," the report warned.

The most common objection to HIS is based on two misconceptions, the report continued: "invasion of privacy and cost of placing all records into electronic storage.

"No record is safe in badly guarded storage of any kind; however, computer tapes need more equipment than a pair of eyes to be read and can be protected from unauthorized readers by suitable programming techniques.

"The question of who should have access to what information is not a technical one," the council said. At present, more people suffer from lack of information about their health problems and their treatment, such as drug reaction, than from improper disclosures."

The report noted that the misconception about invasion of privacy is based on the assumption that electronic records are accessible to more people than are paper files.

The second problem involves the fear of the amount of work and cost involved in placing *all* health care records in electronic storage. "Such detailed transfer is neither needed nor desirable.

"The information already routinely stored on computer tapes for accounting purposes would be sufficient for a very useful HIS, if it were more accurate medically than is needed for accounting, and if better provisions were made for linking records from different sources, pertaining to different persons (e.g., relation by common disease, occupation, neighborhood or by family relation)."

"Immediate steps should be taken on a national level to put into linkable form all records of birth, ambulatory care, hospitalization and death in Canada," the council recommended.

"We envisage that the provincial HIS systems will be linked to form a national grid, built up a number of regional nodes, whose location would be selected by the provincial jurisdictions as a function of geography, demography and computer economics."

The council agreed that much provincial-federal cooperation would be required to evolve such a system and suggested that the senior government could promote compatible development by providing special assistance to provincial members.

The council also gave a note of warning, saying that the number of possible useful applications for various kinds and aspects of HIS is endless. "But these opportunities are matched by the equally endless possibilities of expending funds on such systems.

"Priorities must be given to those applications which will provide benefits more important than equal expenditures on expansion of personnel or other facilities," the council warned.

ABC Makes Most of Movie Stock

NEW YORK – Have you ever wondered how often *Sinbad the Sailor* or *National Velvet* have appeared on your local TV station?

Program managers for the American Broadcasting Co.'s (ABC) five owned and operated stations can keep track of that and other information on their feature film inventory through office CRTs on-line to an IBM 370/158 in New York.

The system lists the films to which the company's five stations in Los Angeles, San Francisco, Chicago, Detroit and New York have rights, noted Paul Kaigan, ABC's director of systems planning and development.

The system provides a story line description "very similar to a TV digest," Kaigan said, and also cites the film's length, the physical quality of the reel, where the film is stored, plus ratings from past showings, number of runs allowed under the contract for the film, number of runs aired and how many are scheduled.

The program manager can also observe whether the film has been or will be aired in prime time, general or weekend slots, for example.

Using an IBM 3275 terminal, a station's program manager typically checks through his own inventory, but can make inquiries into the other stations' data bases too, Kaigan said.

As an illustration, if the program manager wanted to run a Charlie Chan murder mystery series on Saturday afternoons, he could inquire into the five stations' supply of mystery films, tell the system to branch to "mystery-suspense, murder" and scan film titles for "Chan".

The program manager can use the same approach to find a particular star's movies that, for example, were made in color between 1965 and 1971, Kaigan mentioned.

Once the system has branched to the films matching the program manager's request, it can display either a master description of each film or a listing of titles in that category.

Under the previous manual system, program managers had to contend with "four foot stacks of documents" which they had to go through by hand, Kaigan recalled.

"Now we have a better idea of how often a film was used and can quickly check if a film's lease is about to expire [while] we still have airings left on it," explained Jim Donaghy, a project manager with ABC.

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Consolidates Court Data

Boston Cracks Down on Chronic Parking Violators

BOSTON – Illegal parking, a chronic problem in every city of the world, is especially troublesome here, where narrow streets date back to the days before the Revolutionary War.

When cars are double parked or parked too close to corners in some sections, it is almost impossible for fire and other emergency vehicles to get through the streets or to turn a corner.

Until recently, however, law enforcement officials have been unable to do much about it because citations could not be enforced. Each of nine separate district courts had different methods for handling traffic violations and most were manual.

While computers were used in several jurisdictions, there was no way of relating parking violations in one to those in another.

Even the tow-and-hold program, which authorized police to tow a vehicle with five or more outstanding violations, didn't work "because a "scofflaw" with less than four violations in any single court never showed up on a list," according to Deputy Mayor Edward T. Sullivan.

Now Boston is fighting illegal parking with a central computer system that has both increased the number of fines collected annually from $6 million to $14 million and reduced the cost of issuing a summons from $4 to $1.

The new system is based on a medium-size IBM 370/145 utilizing 3742 diskette data entry units.

The system links nine geographically separate courts with the Boston Police Department, the Massachusetts Registry of Motor Vehicles and the computer located in Boston City Hall.

"The new data entry units vastly simplify the job of entering parking violations information into the computer and help hold down data entry costs," explained John Flanagan, data processing services director.

The key factor in the system's success is centralized processing combined with decentralized authority and internal procedures at each court.

The plan was approved and implementation began in 1970. By January 1974, the centralized system was in operation in all district courts. In one case, a two-year backlog was computerized within 9 months. In other courts, two-year backlogs were brought up to date within one year. By spring of 1974, all courts were current on their monthly violations processing.

Briefly, the system operates as follows:

Traffic tickets written by police officers and meter maids are turned in daily to police divisions in each court, with a copy to the court clerk's office. Each violation is recorded on a violations control sheet and is then delivered to one of 20 3742 diskette station.

Each operator enters the ticket number, make of vehicle, registration number and court code. Also entered is the location of the violation and time of day the ticket was prepared.

As the operator keys in this information, it appears on a CRT display screen for quick verification. After the operator approves its accuracy, the data is recorded on magnetic diskettes which are forwarded to the DP center several times a week. There the data is transferred to magnetic tape where it is processed to produce parking ticket reports and other documents for each court.

All documents go to the respective courts, police departments, the registry and other appropriate departments for further action.

Data on diskettes brought to Boston City Hall's central computer is converted to magnetic tape, then processed to produce parking ticket reports for each court and tow-and-hold reports that help police find vehicles belonging to chronic violators and scofflaws.

The monthly parking ticket report lists by ticket number the date of the violation, police department covering that area, license plate number and state of registration, make of vehicle, location of violation, issuing officer's badge number, time of violation, specific traffic ordiance violated, whether and on what date the fine was paid and whether there is still any amount outstanding.

One of the most significant other reports is the tow-and-hold report prepared for the police department. This report lists every license registration number that has accumulated at least five violations, with the court involved in each citation.

In addition, the report tells the police where the violator frequently parks at a given time of day.

"The police tell me it has proved an invaluable tool in getting after scofflaws and removing their cars from the streets," Flanagan said.

Even out-of-state cars, owned by the city's many students, can be towed and held until fines are paid.

"We had several cases where the towed vehicle was not claimed because the accumulated violations exceeded the value of the car," he said.

In such cases, according to Flanagan, the law permits auctioning the car. More important, however, is the fact that the driver is not likely to forget his experience and probably will have a new respect for traffic laws, he said.

Since the new system has become fully operational, at least 23 police officers have been relieved of hand processing summonses. Personnel at the Registry of Motor Vehicles also have been relieved of the paperwork needed to mail 20,000 license suspension notices, issued to chronic violators as the only follow-up for 12 months of unpaid summonses.

The success of the system has reached nearby towns that have requested the city to process their parking violations on a service bureau basis.

Beyond paying for itself through an increase in fines paid, the system may also begin generating an income of its own, according to Flanagan, and "this would be welcome news indeed."

The 370/145 is not dedicated exclusively to traffic violations, Flanagan noted. It also processes work ranging from appropriations accounting through personnel records for 16,000 employees.

Bird Population Simulated

CORVALLIS, Ore. – A simulation project is helping preserve beneficial bird populations and control pest populations.

An Oregon State University zoologist, Dr. John A. Wiens, heads the program, which analyzes and estimates changes in bird population density and energy demands of bird populations.

The computer is also being used to study seabird consumption of fish along the Oregon coast.

Editorials

First Step Promising

Passage of the federal privacy law marks the first step in the fight for legislation to safeguard personal privacy, one of the most cherished rights of Americans.

For the first time citizens will be protected by law from secret personal data collection and will have the right to access and correct any information maintained about them by a federal government agency.

Unfortunately, cost considerations precluded any mass mailings to notify subjects of data files. Enforcement of the law depends on the individual's own initiative in contacting each agency he suspects may be maintaining a file on him.

The bill, which covers only government data systems, does not protect the individuals from violations that occur every day in the maintenance and use of criminal record information and data banks of health and credit information maintained in the private sector.

The commission established to "study" privacy legislation for the private sector has no enforcement powers.

While the Office of Management and Budget has been given the authority to oversee implementation of the law, there is no provision for a single federal standard. Agencies have been left to interpret the law themselves and institute whatever internal practices they believe meet the law's requirements.

Citizens were handed a double blow with the last minute inclusion of a provision that allows agencies to dispense with assuring records are timely and accurate if they are being disseminated in response to an inquiry made under the Freedom of Information Act.

Despite its apparent limitations, however, the law is better than nothing. Much remains to be done, and hopefully, a year's experience with this law coupled with the research initiated by the privacy commission will produce legislation that finds support in the newly elected 94th Congress.

Spirit of Cooperation

The Domestic Council Committee on the Right of Privacy and the Council of State Governments should be praised for the new approach to federal-state relations they initiated with the cosponsorship of their recent privacy conference.

In contrast to the "steamroller" approach many federal agencies are famous for in federal-state relations, the Domestic Council Committee let the Council of State governments run the show.

The agenda for the meeting was left up to the Council of State Governments and its perception of the states' needs.

The discussions gave many participants their first look at the complexity of the privacy issue.

Legislators who had struggled with privacy legislation this year shared their experiences, good and bad, with those who will introduce privacy bills for the first time in 1975.

Conferees got a first-hand look at the difficulty of setting a balance between personal privacy on the one hand and the concept of "freedom of information" on the other.

While the discussions were, at times, long-winded and seemingly inconclusive, by the end of the conference most attendees had a clearer understanding of terms and language and how support for privacy law could be generated.

The new spirit of federalism expressed in this conference has set a new precedent in federal-state relations, one which hopefully will spread.

'See, Dear? NOW Do You Believe Me?'

Letters to the Editor

SCDP, ICCP Not at Licensing Odds; It Was a Question of Priorities

In the story, "Societies Set to Join Caravan" [CW, Dec. 18], it is alleged that the Society of Certified Data Processors (SCDP) and the Insitute for Certification of Computer Professionals (ICCP) "have been at odds regarding the future of the licensing of computer professionals."

SCDP and ICCP may be at odds on several issues, but licensing is not one of them.

SCDP advanced the idea to ICCP and ICCP chose not to accept that issue as one of its important directions. SCDP then made its interest known that it would continue to pursue the subject, and did so with the full knowledge of ICCP.

SCDP continues its work with and its support of ICCP directions. We do not see that certification and licensing are mutually exclusive in any manner. Rather, we see that the former is a very necessary adjunct to the latter.

Thus, there is absolutely no conflict in the interests of the SCDP either with ICCP or with the licensing actions we have taken. We want them both, and we'll gladly work to accomplish both.

Kenniston W. Lord Jr.
President

SCDP
Hudson, Mass.

Evidence Unworthy of Conclusion

Unaccustomed as I am to defending AT&T, I feel that the article headlined "AT&T Private Line Services Excelled by MCI Circuit" in the Dec. 4 issue does not offer evidence worthy of the conclusion in the headline.

As stated in the article, the test performed seems grossly unfair because one of the contestants was informed of the contest and the other was not. Furthermore, no evidence is presented detailing the results of any tests showing MCI to be superior.

In fact, the only data point seems to be that the MCI line failed during the test, and the tester found an advantage in the repair time in comparison with his suspicions of what AT&T's repair time might be if AT&T's line failed.

While I am unable to shed any additional light on the actual facts surrounding this test, I am disturbed that an article of such little substance was given such prominence with such a pejorative headline.

Alan Kotok
Consulting Engineer

Digital Equipment Corp.
Maynard, Mass.

More Smart to the Reference

In response to the various letters to *Computerworld* concerning smart cross-reference lists, please permit me to add more smart to the subject.

I have at my option the same situation of all or none, but with some exceptions. I may request that a list of cross-reference symbols be given in presentation sequence, alphabetical sequence or unsequenced.

If a cross-reference list is to be used for maintenance, it must be complete and be the newest version, or you are stabbing in the dark.

One exception I find to this is in the assignment of new symbols without the use of a cross-reference list. This is safe if you will assign symbols based on a uniqueness derived from the page and line number such as PL999999. This will provide a foolproof method of preventing symbolic reference duplication.

Regarding the showing of unreferenced symbols, the thorough debugger will attack these with vigor. They can be his first indication of something left out or misreferenced.

Bill Pierce

North Wilkesboro, N.C.

Let's Clean House First

Perhaps we should clean up our own field before we go after the government for collecting unnecessary data.

For example, an applicant for membership in the IEEE Computer Society is required to state his/her sex, age, educational level and current employer.

Asked why it needed this data, the organization said it was required "to maintain our records."

How can we complain about the government with that sort of thing going on in our own alleged professional organizations?

Joseph T. Rigo

New York, N.Y.

Hardware Good Place to Start

The title of the lead article in your Dec. 4 issue is shocking: "Recession Infecting DP Budgets?"

I could understand your use of a world like "affecting"; however, the word "infecting" implies that contagion or illness is involved.

We have found in eight years of dealing with cost-conscious DP management that well-run companies in good times and bad times do everything possible to save money.

Since no one wants to lose his job, a good place to start on savings is hardware.

While no company has become infected with hardware savings, we can show many whose health has been improved.

Joseph A. Blitt
Vice-President

Summit Computer Corp.
Summit, N.J.

(Other letters and commentaries on Pages 11, 13 and 14.)

Because of Potential Benefits

UPC May Yet Prove a Boon, Not a Boondoggle

By Robert W. Cort
Special to Computerworld

The reader commentaries by Bob Moneymaker, entitled "UPC: Boon or Boondoggle?" [CW, Dec. 4, Dec. 11], contain so many inaccuracies and so much misunderstanding about the universal product code (UPC) that I want to review briefly how and why the code was selected and then try to address his specific criticisms.

In the late 1960s it became clear that considerable cost reductions in food distribution could be effected across the grocery industry from adoption of a UPC. Those cost reductions were based in large part on the fact that the existence of a code (and a machine-readable symbol of it) would permit the use of automated checkout systems in supermarkets. Such a system promised numerous advantages, such as reduced front-end labor, improved accuracy, better inventory control, etc.

Reader Commentary

Because of the potential benefits of a UPC, and because of the strong possibility of less beneficial independent action by retailers and equipment companies in lieu of a united effort, industry leaders established in 1970 an ad hoc committee to study and make recommendations on the issue. Research studies sponsored by the committee indicated that the net cost reductions from a UPC checkstand system could reach $200 million annually by the late 1970s.

In considering the code selection, the ad hoc committee carefully weighed such key characteristics as the length and structure of the code. The committee utilized input from many sources, including the best available technical assistance from individuals in the computer industry. Thus, there is a strong affirmative answer to Moneymaker's initial question, "Has anyone who is computer-conscious wondered about the validity of a 10-digit code number . . .?"

Seven Digits Minimum

Seven digits, or 10 million code numbers was determined to be the minimum number acceptable to cover all stockkeeping units in the U.S. grocery industry. The fact that any particular store might stock only a small percentage of those items was irrelevant, since the purpose of the code was to provide standardization throughout the industry and not merely within a single store.

Determining the precise length beyond seven digits, however, involved months of study. The industry eventually faced a choice between a straight seven-digit format with numbers assigned centrally to each item and a so-called "mixed" 10-digit format, which was ultimately selected.

Quoting from the ad hoc committee's report of 1971: "The Committee concluded that the most pragmatic solution to the universal product code would be a 10-digit, nondescriptive, all numeric, mixed code. That code would consist of a prefix of five digits which would identify each manufacturer.

"In order to achieve compatibility with the drug and national health-related item code, the first digit would always begin with the numerals 1 through 7 and excluding 0, 8 and 9. The remaining five digits would be assigned by each individual manufacturer."

This solution has a number of unique advantages. First, the proposed grocery code would coexist with most established grocery manufacturer case codes and thus eliminate the expensive reprogramming effort required with a shorter code. By excluding 0, 8 and 9 in the first-digit position, the code would be compatible with the drug and national health-related item

(Continued on Page 13)

Oil, Sugar and Paper

Ever since I lived in Europe I've been a Campari-and-soda fan. It's a great aperitif: doesn't kill the appetite, gives a lift like sherry but doesn't render you gastronomically impotent like two or three martoonies.

So I buy bottled club soda. And I notice that the price *doubled* on name brands like Canada Dry in the last 18 months. Now, why? The water comes out of the same wells (or faucets – I'm suspicious by nature), the bottling plants are in place and being paid for at the old interest rates. Sure, the cost of bottles and labels and CO_2 and labor for delivery has gone up – 20% maybe. So a price rise for soda water might be, say, 10%. Not 100!

What is happening, of course, is that the bottlers see a chance to charge the earth because of the parallel, and much more justified, increase in the cost of sugary stuff like Coke. It all looks alike, doesn't it? So the nonsugar goop and the soda and the genuine water all go up!

And that's what is happening to paper. The trees are grown, the mills are in place and financed, the costs of harvesting the pulp stock and distributing the end product are rising at the rate of the general inflation. And advertising and sales costs are, or obviously could be, drastically less. Yet the cost of paper to the forms manufacturers and to printers in general has in many cases more than doubled.

Everybody is running around, like the oil crooks and the sugar crooks, yelling "Shortage!" *What* shortage? The tree crop didn't fail last year, did it? The demand, tempered by economy drives and the enthusiasm for CRT displays and COM, hasn't risen much.

Just as our ostensibly American oil companies juggled their Canadian, Venezuelan, Nigerian and intercoastal oil transport in 1974 to sell ultraprofitably in Rotterdam and Yokohama, and at the same time create an artificial shortage Stateside so that prices could be escalated unconscionably so the paper boys are playing their little sock-it-to-'em games with the office machine and computer forms suppliers and the end users. Watch the profit figures next time around, fellow victims – as you watched Exxon and Gulf in 1974. Watch the tax dodging and the hide-it-across-the-border Canadian/American accounting tricks.

Ripped off again? Well, unlike gasoline and sugar, we *do* have end-user alternatives. Doesn't help the forms makers, of course – or *Computerworld* – but readers who have delayed going to screen displays and microfilm output ought to get busy.

And one more thing: now is the best possible time to press for elimination of unnecessary reports. IF NOBODY READS IT, DON'T PRINT IT! You'll be a hero to your bosses, and at the same time be moving toward a more sophisticated use of our magnificent hardware. And outwitting the paper crooks, who will lose those pieces of the present market permanently.

Herb Gross

Readers Doubt Confidentiality of Bank Questionnaire

A recent mail questionnaire from a bank president assured customers that the information sought would be both confidential and anonymous.

But the questionnaires – some 20,000 of them – all bore manually stamped numbers (not computer-printed). The same number also appeared on the computer-produced address labels.

The Taylor Report
By
Alan Taylor, CDP

This naturally gave rise to questions, some of which were addressed to me by Taylor Report readers.

Later, Edward K. Ward Jr., president of the Community National Bank of Framingham, Mass., explained that the data in the questionnaires was to be kept confidential from *him* – that he would not be able to see more than some statistical studies. However, this assurance did not dissipate the doubts about the operations that had arisen among informed readers of this column.

Touchy Questions

The questionnaire itself was a big, four page one. It covered a number of touchy points, which some people would not want known to Community National Bank officials with the power to grant or refuse loan requests, references, etc. Even less would they want the data to go outside the Community National, to other banks.

Yet this was the apparent risk. The data was not to be sent to Community National but to Shawmut Associates, a large bank holding company that controls Community National and a number of other banks, many of which operate in the same general area. In fact, many Community National customers are also customers of other Shawmut banks.

Retribution Possibility

This fact added to the complications, as the questionnaire asked people to specifically identify any banks other than Community National with which they did business, and which bank they regarded as their main bank. The possibility of retribution at some later date can be seen in such circumstances.

The questions also asked about a customer's experience with his bank manager and the staff. On the surface, these answers could only be traced to those people who said they only banked at a single branch.

However, other questions about banking habits – do you bank near home or work, etc. – provided enough data to identify the people concerned through a not very sophisticated analysis of banking records and answers. Thus a customer would have to fear that Mr. X or Miss Y knew who had complained about his or her unhelpfulness, arrogance or ignorance.

There were even some personal questions, which really amounted to asking who wears the trousers in the family – the husband or wife? And just what level of education does each have? Did she ever finish high school? These questions, incidentally, are asked even when the respondent is a child or someone other than the husband or wife. Certainly that is the type of "information" which I would not want to see passed around.

However, what most concerned my readers was why the assurances of confidentiality and anonymity were emphasized, why the numbering of the questionnaires had been handled in a noncomputerized manner, etc. Was there some reason for this apparent attempt to mislead?

As one reader put it, "Looked at this way, the wording of the assurance was suspicious. Ward had written, 'You will notice that your name is not on the questionnaire,' and he was pedantically accurate. But the name might as well have been on the questionnaire, since the number was.

"And was the use of the apparently hand-stamped number, in preference to the computer-generated number, designed to make people forget about the possibility of such numbers being used to look up the name of the person concerned?"

Another said: "Do they think that the public is stupid? You would have to be stupid not to associate the numbers. The real question is why Shawmut wanted to conceal its ability to identify recipients, rather than to what use Shawmut is going to put the information." He went on to point out that the effort had, in his opinion, made a liar out of Ward.

Well, that is a strong statement. But an investigation does appear worthwhile.

The Shawmut Market Research office, which Ward's office has indicated was responsible for handling the questionnaire, has stated that the only purpose of using identifying numbers was to keep the data together as it was received.

This response, considering the complexity of the issue, requires further investigation. Next week, Shawmut's point of view will be examined in detail.

Progress Report:

370/STOR 155 & 165

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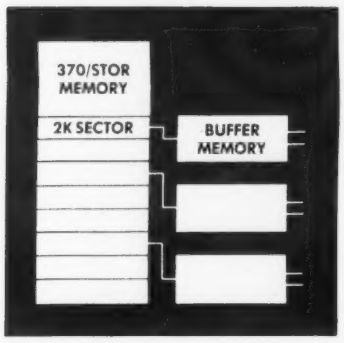

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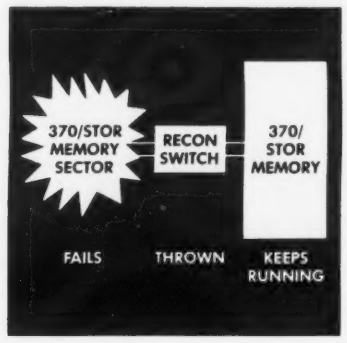
Every 370/STOR memory has a separate buffer memory for each 2K-byte sector of main memory. Whether your main memory capacity is 512K or 4096K bytes, every 2K-block is protected from illegal commands, addresses or accesses by our storage protect buffer. A no-cost feature that eliminates a major memory hang-up problem.



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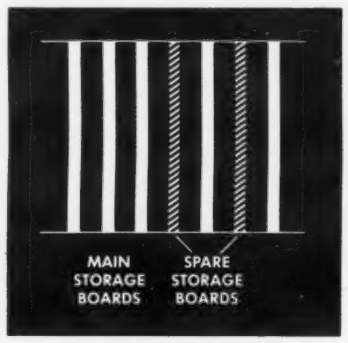
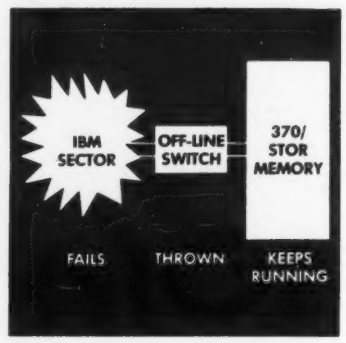
In most memories, a failure in one sector causes a total memory failure. In 370/STOR, a reconfiguration switch lets users dial out a failed sector, while the remaining memory runs at its full capacity. Not only do you keep running, but you minimize time loss. Because with the switch, you correct in minutes what ordinarily takes hours to fix.



ACTIVE SPARES

Some users want even more uptime protection than a reconfiguration switch provides. For them, Cambridge provides an option which incorporates a complete set of spare memory modules which are in a constant standby mode during operations. In the event of a failure, the bad module is dialed out, and a spare one dialed in. That way, the user is virtually always running at maximum capacity.



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Some users have IBM memory resident on their 155 and 165 processors. If the IBM memory fails, the other memory stops running – but not 370/STOR. Our off-line switch lets operators dial out failed IBM memory, and the computer keeps running on 370/STOR memory alone. Cambridge: where high uptime is no accident.

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UPC May Yet Prove a Boon, Not a Boondoggle

(Continued from Page 11)

codes and the national wholesaler codes currently under development.

The code would permit many keypunch activities within retail organizations to use fewer digits than would be used in shorter solutions because in the mixed code they would simply keypunch the prefix once and not repeat it when entering an order, invoice, or other similar data.

This mixed code configuration would also eliminate the problem of maintaining confidentiality on new products and promotional plans, since each manufacturer assigns his own item code, and, thus, is not required to seek a new number from a central agency months in advance of the product's introduction.

The solution also reduces the cost of central code management because of the potential of limiting that code management function to the assignment of prefix numbers only, by having each manufacturer communicate his own item codes as required. And each retail company will have one million codes for use within his organization.

Small Stores Considered

Finally, the proposed 10-digit configuration does not preclude the possibility of manual entry systems for smaller volume stores, assuming careful assignment of code numbers in the system. Specifically, this means large manufacturers are given numbers with trailing zeros and they in turn assign internal code numbers in a similar way for their high-velocity items.

With this coding system, manual entry point-of-sale devices could be designed to require only the numerals to be entered (zeroes would be assumed, such as in a typical adding machine). With this device, a small store operator needs to enter four to six digits on average for most products in his store.

The implication of this solution would be to eliminate the requirement for price marking and repricing in the smaller store and provide the operator with the capability of collecting information, having it processed through service bureaus or cooperating large chains and using it for semi-automatic reorder, as well as to gain other relief from the administrative burden of operating that store.

Thus the choice of the 10-digit code was not made haphazardly.

'Incomplete Understanding'

Many of Moneymaker's criticisms appear to be based on his incomplete understanding about the operation of that system, perhaps a result of his not being aware of the earlier analysis.

For example, throughout both articles there seems to be confusion between the electronic cash register (ECR) and the computerized symbol scan system. The ECR requires manual input and is essentially a logical extension of the electromechanical devices now in use. It does provide for limited use of code numbers, and thus data capture, and could provide some savings through reduced bookkeeping and recapping efforts.

The ECR, however, does not offer the same productivity gains at the front end of supermarkets as is offered by a scanning system which does not require manual input. In fact, the UPC was not developed primarily for ECRs (which do not need symbols) but was designed to be used effectively by both scanning systems and ECRs.

In selecting the code and ultimately the UPC symbol, the ad hoc committee considered the pros and cons of price vs. code scanning. In price-scanning systems, a symbol carrying price information can be applied at the store level. In the code scanning, the symbol, which can be source-marked, carries item identification information which is then matched against price in a computer file.

Scanning Less Worthwhile

Analyses indicated that price scanning was not as economically attractive a system as code scanning. The key variable was the much higher costs of store marking over source marking.

Thus, Moneymaker's statement that "we can also scan a machine-readable code which is only the price" is correct, but it is less worthwhile to utilize such a system.

Reader Commentary

Moneymaker went on to state that "originally, the proponents of the UPC stated that the ECR system and the large investment it required could only be justified by reductions in operating costs (i.e., labor) that would result from the elimination of price-marking items."

No official representative of the grocery industry on UPC has made such a statement. The cost reductions which result from elimination of price-marking items are approximately 25% to 30% of the total hard or quantifiable savings from the program.

These savings are substantial, but they are certainly not the "only" justification for the system.

In regard to price marking, Moneymaker seemed to suggest that proponents of UPC do not recognize potential problems. In fact, the industry has been and remains aware of the real concerns of consumers about price information. Those concerns are being determined in several on-site tests of the UPC system that are presently being conducted.

Moneymaker also suggested file maintenance cost will make the system uneconomical. In fact, based on in-store experience, we have taken such costs into account in our analysis. He also noted that, with the UPC and scan system, the speed of checkout "can also be a disadvantage." In our laboratory and store tests, we know of no complaints from consumers in this regard.

Ultimate Confusion

But the ultimate confusion appears in the next to last paragraph of the first of Moneymaker's articles. He asked, "Has anyone asked the UPC proponents who has a scanner that will read the symbol they pick? Is it the Big Domino? Will all fall in line?"

The answer, of course, is that the UPC symbol was designed after extensive discussions with the companies who make the scanners. Seven of those companies submitted symbol candidates. There are currently eight companies with equipment that reads the UPC symbol. Three of those companies have tests ongoing in stores.

The system is working effectively in eight different stores. This reality seems to have escaped Moneymaker.

Cort is with McKinsey & Co., Inc. in New York.

'There'll Be No Cooking Today — I'm Working Up Our Food Program for the Next 6 Months.'

Letters to the Editor

State-Level Certification Not the 'American Way'

We read with great interest the article entitled "SCDP Proposes Legislation to Regulate DP Profession" [CW, Dec. 11] about the Society of Certified Data Processors (SCDP) and state-level certification.

Without trying to be naive about the whole thing, we are left with several impressions about it which bother us.

• One of the basic premises of the "American way" is that anybody can make it to the top. With this proposed law a person must now pass a test of certification.

We have always believed that a person either makes it or doesn't based on how well he does or doesn't do his job. A programmer or system analyst must pass a test that is far more difficult than any certification exam. His programs or systems either work or they don't.

If they work efficiently, he passes the test. If they don't, he better start looking for another job.

• Professionalism by exam just doesn't make much sense in our business. Webster says a professional is one who is professional. The way a person goes about doing his job and the results he produces show more about whether he is a professional or not.

Natural selection by management that wants results is the best certification exam that American business could ever devise. We know several people who have college degrees and started working in DP. They don't any more because they couldn't produce results or solve problems in business or they weren't "professional" in their job.

Yes, they could probably pass a certification exam (they proved they could pass a test by making it through college), but they couldn't do the job and were selected out.

• We also wonder what would happen to businesses if the law were passed. We've worked in DP for over eight years each and have yet to run into anybody who holds a Certificate in Data Processing (CDP) (which might say something about the present value of it). Overnight, a business must find somebody that has one.

If the management can't find somebody, or if it does and doesn't want to pay a king's ransom in salary, then it just might have to close the doors.

Suppose you are a $100 million-a-year manufacturing company employing 2,000 people, or a utility serving 70,000 homes and you can't find anybody. What do you do under the law but shut down?

• Finally, one must admire the genius of Ken Lord, SCDP's president. In an economy that is seeing membership in all other professional groups dropping, he has found a way to get 100% demand for the members of his organization.

Imagine, the people who have a CDP overnight can have a super salary, job security and unheard of power over all phases of a DP department (and a company).

Somehow the whole thing seems to leave a lot to be desired. In a world where results used to count, we are suddenly going to be run by a person with a piece of paper that says "professional." We wonder why we work so hard when all we have to do is pass the exam and wait for a law to be passed.

Or maybe we should just wait a few more years and become "professionals" by virtue of tenure.

Robert Tatman
Philip Pirker
Ernest W. Snelling
North-West Services Corp.
Tomah, Wis.

CDP Signifies Little

Having failed to rally DP professionals to flock to his clique, Kenniston W. Lord Jr. and his Society of Certified Data Processors have decided to try a more subtle means of establishing Lord as the "Czar of Data Processing."

His draft legislation [CW, Dec. 11] amounts to nothing more than an attempt at forced unionization of an industry and of individuals who do not wish to be unionized in *any* manner.

His worry about charlatans and nonprofessionals in our field is unfounded. As the industry continues to grow, employers have and will become much more adept at "weeding out" unqualified candidates.

The possession of a CDP does not, in itself, indicate that one is professional or even capable of logical thought. All it indicates is that the holder has passed a test, gone to college or hung on for 12 years. Nothing more.

The Systems and Programming Staff
Operations Analysis Department
University of Minnesota Hospitals
Minneapolis, Minn.

Thanks But No Thanks...

When the Certificate in Data Processing (CDP) was first offered, I was a fresh programmer with a brand new Master of Science degree from Georgia Institute of Technology. During the first years of this certification program I saw so many "board wirers" with CDPs framed and hung on tab room walls I was amazed.

Many of these people had already been promoted to their "level of incompetence" in the tab room. I concluded at that time, that I had no desire to be a member of this august group of certified people and have not since changed my mind.

I see the certification program and the SCDP's current legislative proposal as nothing more than a ploy to support restraint of trade and to unreasonably inflate the salary of the "chosen few."

A private company's computer is only a tool – granted, more powerful than some other tools, but still just a tool. It is completely unreasonable and unsound to require a corporation to hire "certified" operators for all their tools.

"Forbid it, Almighty God. I know not what course others may take; but as for me, give me liberty or give me . . . ." retirement.

W. Sanders Mosley
Director of Data Processing
Forsyth County Government
Winston-Salem, N.C.

Dear Computerworld:

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- ☐ ANGRY
- ☐ PLEASED
- ☐ INVOLVED
- ☐ AWARE
- ☐ CURIOUS
- ☐ EXCITED
- ☐ DEMANDING
- ☐ FURIOUS
- ☐ INFORMED
- ☐ SURPRISED

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'Structuring Engine' Keeps Logic, Rewrites Code

By Don Leavitt
Of the CW Staff

PASADENA, Calif. – Until very recently, the only way to modernize existing software was to discard it and start fresh with a clean top-down design and structured implementation. But that usually was expensive in time and talent, according to Guy de Balbine, research director for Caine, Farber & Gordon, Inc.

In a paper submitted to the 1975 International Conference on Reliable Software, de Balbine described an alternative method of attacking the problem. It consists of keeping the global design "as is," especially the data structures, and in automatically transforming every program into an equivalent structured program, visually optimized to make its reading easier and its understanding more thorough.

To make restructuring an efficient and reliable operation, de Balbine's company has developed a software tool called the "structuring engine." As it now exists, this tool is a large PL/I program running on an IBM 370 in a VS environment.

It accepts programs written in Fortran – including any language extensions – acceptable by Control Data, Honeywell, IBM and Univac compilers. In theory, an enhanced engine should be able to handle Cobol input as well.

The complete flow graph of each program unit is analyzed by the engine to determine the best strategy to obtain a well-structured program. Machine dependencies are taken into account when building the flow graph, de Balbine noted, because the interpretation of some statements depends on the particular compiler for which the programs were intended.

The resulting programs are equivalent to those from which they are derived in the sense that they behave identically at run time. That is, they carry out the same sequence of operations on the data structures, the researcher said.

In general, however, the restructured programs will bear little resemblance to the original, unstructured ones, "particularly if the logic was complex and somewhat twisted to start with," de Balbine added. In the output, the logic flows from top to botton, from the single entry to the single exit.

Programs with multiple entry points are split apart so that each entry point has its own exit. To avoid lengthy segments or wasteful code duplication, internal procedures are created and referenced whenever necessary. Procedure creation is crucial to producing restructured modules that are satisfactory both in code clarity and core size, the researcher stressed.

Internal improvement by itself is not enough if the user cannot follow the new program. To visually optimize the resulting code, every statement is laid out according to its logical indentation level, emphasizing its relationship with other statements in the same program unit.

Heuristic algorithms are built into the structuring engine to make decisions whenever alternative solutions are feasible. The system might have to decide, for example, whether to keep a portion of code in line or to turn it into a subroutine executed remotely.

The research firm's experience so far indicates that "good" decisions – ones in which no obvious improvement has been overlooked by the engine – can be made automatically "with a high degree of success," de Balbine claimed.

Of course, he added, if the modules to be restructured contain logic errors, the same errors will be found in the structured output. Only a programmer can discover and correct errors in coding that are acceptable to the compiler but inappropriate to the solution of the user's problem, the researcher said.

Commenting on the execution characteristics of the restructured programs, de Balbine said he found some increase in core size, running approximately to 10% but depending very heavily on the complexity of the original logic. The expansion takes place in some cases since, for the present, the system is set to keep the same execution sequence as the original even when it requires more core.

Thus far, de Balbine has not found significant variations in the running time of the original and the restructured programs. If there is a trend, he added, it seems to be toward a reduction rather than an increase in the running time, even though this is somewhat paradoxical in view of the slightly larger core size.

The paradox is explained, however, by the fact that the average basic block length is increased and a restructured program, having a simpler structure, is handled better by some optimizing compilers, de Balbine said.

In System Software, Languages

Added Instructions to Aid Eclipse Processing

SOUTHBORO, Mass. – Operating systems and high-level language processors developed by Data General Corp. for delivery with first shipments of the Eclipse computers in February tend to be more "hardwired" than previous software from the minimaker.

In the operating systems, functions that ordinarily would have been done with software routines – including device servicing, I/O operations, user request servicing and switching among a number of users – are done by specific instructions that the operating system can address.

The programming languages (Fortran IV, Fortran 5 and extended Basic) are also said to take advantage of an enhanced instruction set when doing such functions as arithmetic calculations, data movement and subroutine calling.

The operating systems include a mapped real-time disk operating system, a real-time disk operating system, a real-time operating system and a stand-alone operating system.

In the Eclipse system software one instruction, vectored interrupt, triggers all the steps required when a device calls to the computer for servicing and does them all in less than 20 μsec, according to Data General's claims.

Another innovation makes the device servicing reentrant so that a number of similar devices can be handled without reloading the servicing routine.

Data movement, especially related to I/O operations, is likewise improved, according to Data General, through the use of single instructions rather than full subroutines. Block Move, Block Add and Move, Load and Store, Load Byte, Set Bit and Test Bit are among the new single-instruction facilities, a spokesman added.

A number of stack instructions in the Eclipse instruction set can manipulate user requests, queue user interrupts in the proper sequence and save the state of the stacks' other jobs that are awaiting processing. And a load Map instruction switches the complete Map state from one user to another, he said further.

In the language processors, the byte-level data movement instructions are available, as are calling and dispatching facilities by which the user may take advantage of the hardware stacks. The Eclipse line will have signed and unsigned instructions for integer and floating point arithmetic, although the floating point processor is a separate processor, the company noted.

Random Notes

Word/One Text Editing Available on West Coast

LOS ANGELES – New York-based Bowne Time Sharing, Inc. has opened a regional office here to make the capabilities of the company's Word/One text processing service available to users in this area.

With the service, secretaries and typists working at typewriter-like units in their own offices can input draft documents, make corrections and generate finished output. As an option, output could be directed to Bowne's photocomposing facilities for unique type faces and sizes.

The local Bowne office is at 1706 Maple Ave.

Correction

The Dynamic Display Monitor [CW, Dec. 4] requires only 22K bytes of storage, according to a spokesman for A.O. Smith Corp., Data Systems Division.

'Panda' Reports Disk Use, Cost

OAK BROOK, Ill. – Two extensions for Pansophic Systems' disk analysis and data set management package, Panda, are designed to enhance the use of disk space and to make the user aware of the costs – in dollars and cents – of disk space use.

Reports produced by Panda for IBM OS or OS/VS shops show the status of each data set, the space allocated, the percentage of allocated space actually used, dead tracks, extents and data set characteristics.

Analyses of partitioned data sets and indexed sequential (Isam) files are also provided.

The Scratch Exit routine removes unauthorized and obsolete data sets from each volume monitored by Panda. Unauthorized data sets, in this case, are those which do not comply with the installation's naming conventions, a spokesman explained.

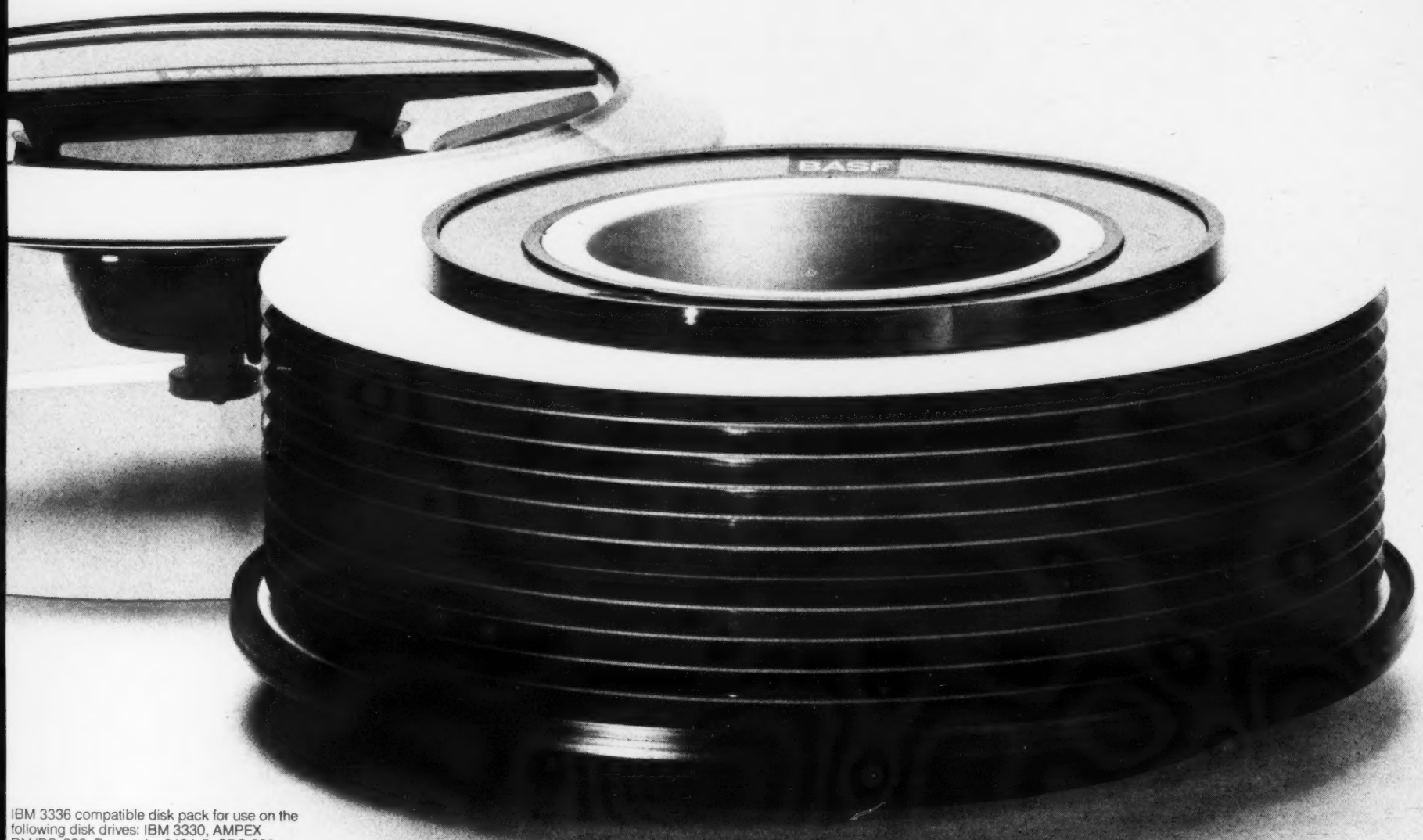
Obsolete data sets are those left behind, partially completed and usually not properly Closed when a job Abends. They contain little data and maintaining them wastes disk space and may force reruns of other jobs because expected space is unavailable, Pansophic said.

With the Billing Exit routine, each user report ends with a three-line summary of costs. The first line represents the space costs of direct access storage devices (DASD) for all data sets belonging to the corporate unit for which the report has been prepared.

The second line at the end of the report shows costs of maintaining obsolete data sets and over-allocated sequential data set tracks. The final line is, in effect, an optimum bill showing what the cost would be if the data sets were better utilized.

These new routines are available free to current Panda users and will be included in all new deliveries of the $1,800 package, Pansophic spokesmen said from 1301 W. 22nd St., 60521.

If you think all disk packs are alike, take a closer look at the BASF 1236.



IBM 3336 compatible disk pack for use on the following disk drives: IBM 3330, AMPEX DM/DS-330, Burroughs 9484-5, CDS 230 or 231, Calcomp 1030, CDC 9754 Series, DIVA DD-40, Honeywell DSS 190, Mohawk 8830/8330, NCR 658, STC 3835/3335, Univac 8430, Telex 6330, Xerox 7275.

Because all disk packs conform to certain industry standards, you might think they're all equal. They aren't. The important difference is the extent to which a manufacturer is willing to go in order to *exceed* industry standards. It's a matter of making a disk pack better than you really need, because there could be times when you need it. Let's look at a few superior points of the BASF 1236 disk pack:

The binder that won't quit

As you probably know, magnetic coating doesn't stick to the aluminum disk all by itself. We use a special binding agent to produce an incredibly strong bond. The disk is sealed to prevent oxidation, so you can be sure that the coating won't peel or flake off.

Our own coating process

As the trend toward higher packing densities continues, it becomes increasingly important to monitor the thickness of coating deposited on the disk. The problem is compounded by the necessity for progressively varying the coating thickness from the outside toward the inside of the disk, because packing density is greater as the circumference decreases. For those reasons, we've discarded conventional coating methods in favor of an exclusive process using our own BASF-designed equipment.

A polished performance

Following the coating operation, we use our own exclusive polishing process to achieve optimum surface regularity. We've been able to achieve a surface so flat that the possibility of a head crash being caused by uneven disks is completely eliminated. We might mention here that the coating and binder formulation, combined with coating and polishing techniques, all are important factors in achieving surface hardness, which is the ability of the coated surface to survive excessive or extended head loading.

Achieving balance

Like any rapidly rotating object, a disk pack will behave strangely if not perfectly balanced. In our precision balancing operation, any weighting required is screwed into place, which eliminates the potential of shifting inherent in a conventional adhesive weighting system.

And to make sure...

We test our 1236 disk packs to standards much tighter than those of the leading equipment supplier. If anything unpleasant should happen, we'd much prefer it happen here than on your drive. As a regular procedure, we do scratch tests to check coating thickness, impact tests to determine head crash resistance, detergent tests to check resistance to wear and temperature variations, and drop tests to make sure balance and alignment don't shift during shipment. We test to make sure our 1236 disk packs are error free.

Finally

Our 1236 costs no more than other twelve-high disk packs. You're already paying for BASF quality... you might as well have it. For more information on the 1236 or other BASF disk packs or cartridges, write to BASF Systems, Crosby Drive, Bedford, Massachusetts 01730.

You're already paying for BASF quality, you might as well have it.

BASF

Structured Programming — Part 2

Some Forms Must Be Simulated

By Michael Karmi
Special to Computerworld

As noted in the first part of this series and in other publications, structured programming is keyed to three basic logical constructs: linear movement from one operation to the next, IF . . . THEN . . . ELSE choices, and DO . . . WHILE control of looping

The special characteristic of Cobol provides two additional control structures. These structures are variations of the basic figures.

Concepts and Techniques

A DO . . . UNTIL pattern is a reversed form of DO . . . WHILE. A case pattern is an extension of IF . . . THEN . . . ELSE, providing multiple branch capabilities.

In practical coding, two of the structured programming contructs – IF . . . THEN . . . ELSE and DO . . . WHILE – are implemented directly through Cobol statements. There are no DO . . . UNTIL and case statements in Cobol, so these constructs have to be simulated through conventional statements used in particular structured forms.

IF . . . THEN . . . ELSE tests a condition to determine which of two function blocks will be performed. For example:

```
IF A < B
   PERFORM F-LEFT ELSE
      PERFORM F-RIGHT . . . etc.
```

The ELSE action may be omitted.

DO . . . WHILE provides the basic controlled loop. The PERFORM verb with the UNTIL option implements this construct: condition p being tested prior to execution of F funtion.

However, because execution of the UNTIL option terminates of a "true" condition, it is necessary to code the inverse of the condition p in order to loop while the condition is true. For example:

```
PERFORM A-FUNCTION
   VARYING B FROM 1 BY 1
      UNTIL B NOT > C etc.
```

The loop will be terminated when the value of B will be equal to C. The VARYING option provides that the value of B is increased in every pass independently of the internal structure of A-FUNCTION.

DO . . . UNTIL also provides a loop capability different from the previously described DO . . . WHILE:

(a) The condition p is tested *after* each execution of the function F, so that F is always executed at least once.

(b) The test is reversed, so the loop terminates when p is true.

Since no Cobol statement provides such a capability, the DO . . . UNTIL figure must be simulated:

```
PERFORM A-FUNCTION.
PERFORM A-FUNCTION
   UNTIL B > C etc.
```

A-FUNCTION will be performed at least once even if B > C.

The case construct is a multiple selection of functions to be performed, depending on the value of the i identifier. The GO TO . . . DEPENDING ON . . . Cobol statement does not provide an adequate exit point. Therefore, it must be simulated as follows:

```
paragraph-name
      GO TO paragraph-1, paragraph-2,
   . . . . . paragraph-m  DEPENDING
   ON i
      GO TO case-exit.
paragraph-1.
      (statements)
      GO TO case-exit.
      *
      *
      *
      *
      *
paragraph-m.
      (statements)
case-exit.
      EXIT.
```

The case statement itself should be executed via an in-line PERFORM such as the following:

PERFORM paragraph-name THRU case-exit.

These methods of implementing the basic logic structure in Cobol coding must be seen as recommendations, based on experience. One should keep in mind in approaching structured programming that the goal is to produce programs which are easy to read, easy to understand and easy to maintain.

Documentation

Good documentation is essential to the success of an application development effort. Structured programming, which leads to more readable, self-documenting programs, also introduces a new documentation tool: the structured chart.

The structured chart shows program modules and their hierarachical interrelationships. Each box on the chart represents a program module. The connecting

(Continued on Page 18)

Accountants Gain Graphic Tool In MSA General Ledger Update

ATLANTA – Accountants can call for graphic display of selected lines on financial reports on an as-needed basis with an enhancement to the MSA General Ledger package from Management Science America, Inc. (MSA).

Utilization of the graphic capability is completely in the hands of the accountant, requiring nothing from the DP staff when the special output is desired. Requests for graphics are submitted along with the financial data that make up the input for the next processing cycle.

The software accepts the requests, collects all the appropriate data and performs all the necessary calculations to scale the desired graph to the space available, taking into account the range of the data being plotted.

The sample output provided by the vendor indicates that two graphs may be printed on a single page

The MSA General Ledger program is written in Cobol and can be run on IBM 360/370, Burroughs B3500/B3700, Honeywell and ICL systems. The basic package requires about 87K bytes on IBM gear, and the graphic feature adds another 10K bytes when it is in place in the CPU.

A basic MSA General Ledger capable of utilizing the graphic feature costs about $25,000, a spokesman said from 3445 Peachtree Road, 30326.

Structured Code Uses Simulation

(Continued from Page 17)

lines represent the PERFORM relationship between the module and a higher level module. A module PERFORMed by more than one module may be repeated in the structure.

Such a hierarchical structure chart provides a useful overview of the whole program and can serve as a development aid. Depending on the complexity of the program, each module (represented by a single box on the program's structure chart) can be charted in detail.

In contrast to the flow chart, the structure chart contains no information about the conditions under which a certain module will be executed.

Since every program module is to be considered as a closed unit with one single entry and exit point, it can be considered functionally, as obtaining an input from other parts of the program performing some kind of processing and returning an output for further use by other program modules. The I-O Function Table describes the data required for each module and the data returned.

The techniques I have described represent a disciplined approach to the application development. Their real value must be measured by the improvement of project manageability, staff productivity and program reliability and maintainability.

Structured design reduces the effort needed to fix and modify programs. Original errors are reduced when the problem at hand is simpler.

Structured design concepts are not new. The assembly-line idea is one of isolating functions in a way that still produces a complete, complex result.

The groundwork for this idea was laid more than a century ago by Eli Whitney, in suggesting the production of complex firearms from simple, interchangeable components. We can demonstrate with endless samples from other industries the advantages of isolating functions.

Programming is very often referred to as an art. The time has come when it can be brought closer to science, where current work is built on the results of earlier work. The goal of the Data Processing industry is to produce programming systems with fewer errors, at a faster rate and in a way that makes modifications easy and quick.

Structured programming may not be the ultimate answer but surely it can help to achieve this goal.

Karmi is a programmer analyst with Worthington Compressors, Inc., Buffalo, N.Y.

Best Route to Reliable Facilities? Build Your Own

By Edith Holmes
Of the CW Staff

DELRAN, N.J. – In terms of reliability of operation, data communications users rate Bell System facilities slightly higher than those of Western Union, other telephone companies and the specialized common carriers.

But communications facilities built, owned and operated by users earned even higher reliability ratings than the Bell System facilities, and the specialized carriers outscored the Bell System in both ease of installation and promptness of repair, according to a survey conducted by Datapro Research Corp.

Included in a report entitled "All About Data Communications Facilities", the survey forms one part of a description and analysis of the communications services supplied by the telephone companies and other common carriers.

In an effort to determine the degree of satisfaction with the various communication links being used and to develop "a feel" for the types and patterns of communications facilities in use, the research firm asked users to describe and rate the communications facilities they employed.

Datapro's survey drew 337 usable responses. Because many respondents used more than one class of facility or planned to obtain the same class from more than one source, the 337 replies actually generated a total of 456 responses, the report said.

The numbers of users who rated each supplier's offerings were as follows: Bell System, 321 users; other telephone companies, 54 users; Western Union, 36 users; specialized carriers, 20 users; and user-built facilities, 25 users. By assigning a weight of 4 to each user rating of excellent, 3 to good, 2 to fair and 1 to poor, Datapro calculated weighted average ratings of reliability.

The report indicated Bell system users rated the reliability of the operation of their communications facilities at 3.1, while other telephone companies received a 2.5 rating; Western Union, 2.9; specialized carriers, 3.0 and user-built facilities, 3.6.

Ease of installation received these average user ratings, according to the report: Bell System, 3.1; other telephone companies, 2.6; Western Union, 2.9; specialized carriers, 3.2; and user-built facilities, 3.

Users rated "quickness to troubleshoot and fix problems" as follows: Bell System, 2.5; other telephone companies, 2.2; Western Union, 2.3; specialized carriers, 2.8 and user-built facilities, 3.1.

The responding users employed a variety of line types. Fifteen percent used leased telegraph-grade; 77%, leased voice-grade; 11%, leased wideband; 40%, switched voice-grade; 14%, Inwats; and 28%, Outwats.

The survey found that the average number of lines per user was 27.3, the average line length was 227 miles and the average line usage was 11.5 hours per day.

Lack of Expertise

While not everyone encountered difficulties in the area of troubleshooting, users who have experienced problems repeatedly commented that local data representatives are lacking in knowledge and that a considerable amount of finger-pointing goes on before the source of the problem is identified.

"There were also some nice things said about the various carriers," the report continued. "The positive comments generally took the form of 'no problems,' which is about as nice a comment as can be made about a communications link."

Reprinted from the December supplement to *Datapro 70*, the 27-page report is available from the company at 1805 Underwood Blvd., 08075, for $10 per copy.

Datran Chief Predicts

'Telecomputer' Concept to Mark End of Private Nets

CAMBRIDGE, Mass. – With the virtual fusion of computers and communications into a single system by 1980, the age of the "telecomputer" will be fully born, Glenn E. Penisten, president and chief executive of Data Transmission Co., told the audience at a Harvard-MIT joint communications policy seminar here recently.

Using "telecomputer" to characterize a system that both moves and manages information simultaneously without limiting interfaces, Penisten indicated this system would be "designed, not adapted, to teleprocessing. As this happens, we will see a virtual disappearance of any private network for data communications and of point-to-point private-line services," he said.

Penisten argued that many of the current constraints on teleprocessing are directly related to the immaturity of the marriage between computers and communications. "It is no secret that computing power has been outpacing the available communications systems that can handle it; it is possible that the race was over before it began."

'Out of Balance'

Because existing commercial communications systems were designed primarily for the human voice and not the digital nature of the machine information world, he contended the teleprocessing world "has found itself increasingly out of balance." While some large users have been forced to construct their own costly private networks, most computer users with communication requirements must make do with an inferior communications capability that is both frustrating and taxing to the mainframe's productivity, Penisten said.

Leasing private lines provided by common carriers involves both a dependency on what these suppliers will give him in the form in which they choose to give it and payment for a private-line service 24 hours a day, 8,640 hours a year, regardless of how much time is actually used for communications, he added.

"Out of desperation, because some users can not afford either their own private networks or leased private lines, they avail themselves of portions of the switched voice telephone network that provides the least satisfactory performance of all for data communications," Penisten commented.

"Whether private network, leased private line or switched voice network, the user is undertaking at considerable expense the burden of providing for himself a limited form of data communications lacking in needed capabilities." Because these services aren't being provided for the user, Penisten contended the business tasks that teleprocessing is designed to serve "are either not being met at all or are not being met given the system's cost and productivity's demands.

But he argued that at least three important forces are working toward the disappearance of any tangible interface between computers and communications.

First, users are no longer mere "data processors" or "communicators"; they are "teleprocessors. Remote processing and distributed intelligence have transformed the computer from a stand-alone administrative and clerical number cruncher and typewriter into a processing and communicating network that is part of a sophisticated extension of management's planning.

In addition, technological innovations, including LSI electronics, leading to minicomputers, intelligent terminals, digital microwave transmission and time division switching are rendering the teleprocessing mode more flexible and less costly.

Finally, Penisten expected enlightened regulatory policies to "provide the impetus for innovation and change sparked by competition in specialized communications.

The disappearance of private networks will be possible through the development of true data communications utilities, he said. To date, the private networks have been kept alive because there has been no significant improvement in performance and a total lack of cost reduction.

Switched digital data transmission systems, and perhaps some form of message switched communications, will provide primary impetus for communications as broadly available as any other utility.

A Myriad of Uses

Within the telecomputer framework, there will be a number of general application areas that will, singularly or together, fit into a particular telecomputing system, according to Glenn E. Penisten.

Among these are:

- The sharing of computer resources for problem-solving and administrative functions, i.e., the time-sharing application.
- Retrieval of bulk information from computer data banks.
- Transactional applications – interacting with a computer to satisfy a discreet function such as reservations systems. This is mainly an inquiry response or sales related application.
- The transfer of files by the computer – especially a trend toward large file transfers.
- Remote job entry, i.e., having full access to a remotely located computer as though it were standing in the next room.
- Data collection applications for the reading of regular information.
- The transfer of correspondence and administrative material on a point-to-point base. This is usually described as "electronic mail."

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Data Communications

Course #1010 – Practical Data Communications Systems and Concepts

This course will give you the information you need to master the newest developments in Data Communications. Led by the nationally recognized teleprocessing consultant, Dr. Dixon Doll, the course covers recent changes in areas like SDLC. HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of satellite carriers. This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule is as follows:

Los Angeles – Jan. 13-14
Chicago – Jun. 2-3
Orlando – Jul. 2-3
New York – Feb. 10-11
Washington, D. C. – Jun. 9-10

Course #1020 – Advanced Teleprocessing Systems Analysis and Design

This course is a follow-up to Course #1010, with special emphasis on problem solving techniques for minimizing operating costs in commercial data communications networks. Also led by Dr. Dixon Doll, the course covers procedures, approaches and algorithms for evaluating and cost-optimizing network organizations.

This seminar runs three days, and total cost, including an extensive set of customized course materials, luncheons and continental breakfasts is $450. Additional registrants from the same company qualify for a reduced rate of $400. Current schedule is as follows:

New York – Jan. 27-29
Los Angeles – Jun. 16-18

Data Base Management

A practical approach to the design and implementation of data base systems.

The difference between an effective data base system and a waste of computer time and memory lies in effective planning, system selection and management. And this course gives you both the information and the basic experience you need for the proper design and implementation of a data base system.

Given in association with Leo J. Cohen and Performance Development Corporation, this course covers a comprehensive list of topics, including:

- *the description and definition of the Data Base System Project.*
- *the development of a full-service analysis and system design.*
- *optimum file organization and indexing techniques.*
- *all available indexing techniques and their implementation.*
- *all aspects of system management.*
- *and much more.*

One of the key features of this course is the workshops, in which you'll apply what you've learned. And before you're finished you'll have "done" a complete, on-line order entry / inventory management system.

You should attend this seminar if you are (or will be) involved in the design and implementation of a data base system – whether as a DP Manager, Data Base Administrator, Planner, Analyst or Programmer.

This course runs for 3 days, and costs $350, including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule:

Boston	Sheraton Boston Hotel	February 10-12
Los Angeles	Los Angeles Marriott	March 3-5
Chicago	Sheraton O'Hare Motor Hotel	May 12-14
New York	The Plaza	June 2-4

Contracting for Computers and EDP Support Services

A seminar that can help you protect your EDP investment – and your system.

In an industry that's famous for its "promise them anything" attitude, you need good, effective contracts from the vendors that supply your installation. And this seminar gives you the information you need to get them. It will show you how to protect your installation from late deliveries, inadequate equipment or services and the costly disruptions that they can cause.

Course topics include the lease and purchase of computer systems, separate hardware and software – the purchase of time sharing, data processing services and consultation – and the use of facilities management.

Under the personal instruction of Roy N. Freed, a nationally known lawyer, author and expert in the field of computer law, you'll learn how to place yourself in a strong bargaining position, how to insure on-time delivery of exactly what you want, how to set reasonable performance standards for warranties – and much more. You'll also receive a complete resource notebook, *including sample vendor contract forms.*

You should attend this seminar if you are involved in the purchase of EDP equipment or services, whether as a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm.

Cost for the entire 2½ day seminar, including complete resource notebook, continental breakfasts, luncheons and coffee breaks is $295.00. The current schedule:

Los Angeles	Los Angeles Marriott	January 15-17
Chicago	Hyatt Regency O'Hare	February 26-28
Atlanta	Stouffers Atlanta Inn	April 23-25
New York	St. Moritz	June 4-6

Operating Systems and Virtual Storage

A seminar on more efficient operation of your computer system.

Large installations now expect many programs to run simultaneously *and* efficiently. And that's what this 2½-day seminar is all about. Under the leadership of Dr. Ivan Flores, author of 14 books and one of the world's most prolific writers on systems software, you'll gain an excellent technical knowledge of your operating system, OS and VOS. The course uses the IBM/370 as its subject computer, because of its popularity, and includes these topics:

- Overview of Operating Systems
- Hardware aspects of Operating Systems
- Job Management
- Task Management
- Data Management
- Virtual System Philosophy
- Virtual Hardware
- Virtual Storage Operating Systems

Everyone involved with operating systems can benefit from this seminar. Programmers can employ its lesser known features. The manager can choose an operating system and options to handle *his* installation more efficiently. The chief operator can understand what's happening and better manipulate the system. The executive can determine the requirements for his plant.

Cost for the entire seminar, including course materials, luncheons and continental breakfasts is only $295. Current schedule: New York February 3-5
St. Moritz Hotel

THE EDP SEMINAR SERIES sponsored by COMPUTERWORLD

Key-to-Storage Systems

How to evaluate and optimize the various successors to keypunch equipment.

Data entry is a big problem – and a big headache – as every computer user knows. It is therefore a prime target for cost savings. This course is designed to help you in the practical aspects of selecting, installing, and making the best use of keyboard-to-storage systems. It is an expansion and an update of our successful key-disk seminar. Under discussion (including some user case studies) will be:

- Introduction to data entry concepts (keypunch, buffered keypunch, keypunch, key-disk and beyond . . .)
- Key-disk hardware and software
- Evaluating . . . and starting . . . key-disk systems
- Selecting and operating intelligent terminals, both key-to-cassette and key-to-floppy disk
- Key-disk as a remote batch terminal
- Supervisor functions; motivation
- Mixed Media systems
- Trends in Computer Data Entry

This seminar is lead by Lawrence Feidelman, President of Management Information Corporation, and one of America's leading experts on data entry. All participants will receive a copy of "Data Entry Today", Management Information Corporation's authoritative publication on every aspect of data entry, including a six-month update of this continuing reference service.

You should attend this seminar if you are concerned with optimization of your data entry shop, and especially if you are considering or currently using key-to-storage systems more advanced than basic keypunch. Cost for the 3-day seminar is $350, including continental breakfasts, luncheons, and all course materials. Additional registrants from the same company are charged only $300.

Los Angeles	Sheraton Inn (Airport)	February 3-5
New York	Waldorf Astoria	April 21-23
Chicago	Hyatt Regency O'Hare	June 9-11

To: Ed Bride, Vice President, Editorial Services, Computerworld
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NOTE: If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

Time Division Multiplexer Made For Synchronous Communications

WILTON, Conn. – A bit-interleaved time division multiplexer (TDM) designed specifically for synchronous data communications networks has been released by General Datacomm Industries, Inc.

Transparent to data, the TDM 1251 accommodates any device which transmits or receives a serial, synchronous data stream. It can be incorporated into a network with no changes in system operating concepts, according to the firm.

The company noted that the TDM will operate with any standard input rate from 600 bit/sec to 64 kbit/sec and will multiplex to a maximum output speed of 256 kbit/sec.

Though dependent on the number and speed of the inputs, the device can accommodate up to 62 input channels.

The vendor provides a separate connector for each channel with EIA RS-232, CCITT V24 or CCITT V35 interface. And the standard configuration of the multiplex is said to accept rates of 1,200-, 1,800-, 2,400-, 3,600-, 7,200-, 9,600- and 19,200 bit/sec.

Standard output rates accommodated by the 1251 are 4,800-, 7,200-, and 9,600 bit/sec and 19.2-, 38.4-, 50-, 56-, 64- and 72 kbit/sec.

The interface conforms to the requirements of EIA RS-232 and CCITT V24 for rates up to 19.2 kbit/sec and to the requirements of CCITT V35 or AT&T 303 data sets for rates above 19.2 kbit/sec, according to the firm.

Featuring on-line monitoring of each channel displayed at both ends, the 1251 is said to provide users with control of both the local and remote multiplexer's right to the terminal interface. Each individual channel can be looped back without affecting the operation of any other channel, the vendor claimed.

The TDM 1251 system costs $3,700 from the company at 131 Danbury Road, 06897.

Acoustic Coupler Handles Normal, Automatic Modes

PHOENIX – An acoustic coupler with built-in intelligence has been developed by Omnitec Corp.

Specifically designed to interface with Bell's 202CR reverse channel modem over the switched telephone network, the Bawdy 12 operates at 1,200 bit/sec in two line protocol modes, normal and automatic, according to the firm.

In the normal mode, line control is said to be established via RS-232 signals originated from the remote terminal. The company said while line turnaround receive or transmit decisions are based on intelligence supplied by the terminal or an operator, timing is determined by the acoustic coupler.

Line control is established by intelligence within the Bawdy 12 in the automatic mode, the firm said. Slaved to the remote 202CR modem, the coupler maintains all logic and timing.

In this mode, the company remarked, receive or transmit will always be opposite from that of the far end modem.

The device sells for $985 from the firm at 2405 S. 20th St., 85034.

Multiplexer System Links Decsystem-10 To 360/370s, 2780-Type Terminals

MARLBOROUGH, Mass. – Digital Equipment Corp. (DEC) has introduced a synchronous communications multiplexer system that provides a link between the Decsystem-10 mainframe and IBM 360/370 systems. The system is primarily designed to support IBM 2780-type terminals or those from other vendors operating in 2780-type mode.

Called the DAS 78, the system utilizes IBM binary synchronous communications protocol at speeds up to 100 kbit/sec, the company said.

The DAS 78 includes a 16K PDP 11/40 processor; the DL 10 memory sharing interface which connects the PDP-11/40 to the Decsystem-10; the KG 11 CRC16 arithmetic unit and up to 16 single line synchronous interfaces.

In addition, the DC 76 asynchronous communications concentrator is required. But users who have newer versions of the Decsystem-10 may already have this capability as part of their CPU, a DEC spokesman said.

A typical DAS 78 system for "several synchronous lines would cost about $55,000," the spokesman said.

Although mainly designed to support 2780-type remote batch terminals on up to 16 synchronous lines, the DAS 78 can also act as an interface between the Decsystem-10 and a 360/370 mainframe. In such systems, the host CPU would be connected with a 270X or 370X front end from IBM.

The DAS 78 is compatible with most IBM 2780 software including ASP, Hasp and Power, the spokesman said.

When connected to a 360/370, the DAS 78 allows the Decsystem-10 to emulate the operation of a 2780-type device into the mainframe system. Decsystem-10 users are able to submit jobs to the IBM CPU from disk, tape or cards using standard DEC commands and output can be received on the Decsystem-10's disk or printer, the spokesman added. First deliveries of the DAS 78 have already been made.

Terminal Transactions

Print Option Added To Sycor Model 250

ANN ARBOR, Mich. – Sycor has added an overlapped printer option for its Model 250 intelligent on-line terminals to allow printing of CPU-originated data without disrupting the contents of the display screen.

The overlapped printer option is available on 80- and 165 char./sec matrix printers in the Sycor 2580 Series and may be used with either stand-alone or clustered Model 250 terminals.

The option includes a 500-character buffer into which data is routed from the communications line and from there to the printer via direct memory access. A control character in the data stream automatically indicates an overlapped operation.

The option adds $20 to the price of the matrix printers. The price of the 80 char./sec printer with overlapped option is $175/mo on a one-year lease; the 165 char./sec printer with option is $245/mo on a one-year lease. Prices include maintenance.

Delivery is 60 days from the firm at 100 Phoenix Drive, 48104.

Tektronix Hard-Copy Unit Compatible With 4010 Series

BEAVERTON, Ore. – Tektronix, Inc. has introduced a hard-copy unit that is plug-compatible with its 4010 series of graphics terminals as well as with the 613 storage display unit.

Called the 4631, the unit is intended as a direct replacement for the company's 4610 hard-copy unit and can be used with either the 11-in. or 19-in. storage tubes of the Tektronix 4010-1, 4012, 4013, 4014-1 or 4015 terminals.

The 4631 costs $3,895 and is available from the firm through P.O. Box 500, 97005.

IBM 3776 Has Print Capability For Remote Job Entry

WHITE PLAINS, N.Y. – IBM has introduced the 3776 communications terminal which provides a high-speed print capability for remote job entry applications.

The 3776 operates at a maximum of 230 line/min with a print belt containing 64 characters or at 300 line/min with a 48-character print belt. This compares with a maximum print speed of 120 line/min on the earlier 3775 terminal.

The new terminal can operate at speeds up to 4,800 bit/sec using IBM's Synchronous Data Link Control (SDLC). The unit can also operate with a Binary Synchronous Communications (BSC) network and a switch is available to "aid the move" from BSC to SDLC, IBM said.

Input/output equipment compatible with the 3776 includes up to two diskette storage devices, the 2502 and 3501 card readers and the 3521 card punch.

Security features on the 3776 include an optional identification reader that can handle magnetic striped cards and a keylock arrangement for functional operations.

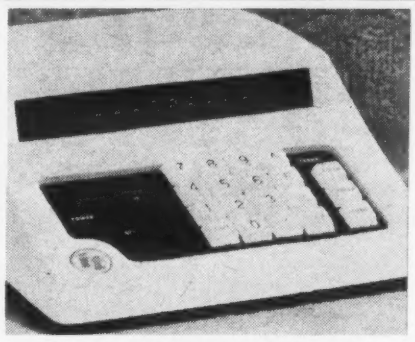
The terminal is available under the Extended Term Plan 24-month contract and a typical configuration including one diskette, a 3501 card reader and "several features" will cost about $760/mo. Under the Monthly Availability Charge the cost will be about $900/mo and purchase is $30,000.

Interactive Terminal Features Serial TTY, RS-232 Compatibility

ST. LOUIS – An interactive terminal introduced by Interface Technology, Inc. features serial TTY and EIA RS-232C compatibility along with four-, eight-, 12- or 16-character LED readouts.

When connected to most minicomputers or to a modem for remote access to a mainframe, the Model 736 communicates with the system through either a serial asynchronous 20 mA current loop or an EIA RS-232 interface. It operates at switch-selectable rates of 110- or 300 bit/sec, according to the company; half- or full-duplex operation is also switch-selectable.

With a 19-key keyboard, the terminal provides the operator with a total of 32 Ascii characters for transmission. In addition, eight backlighted operator guidance displays with replaceable film legends can be activated to indicate specific conditions, depending on the application, the vendor said.



Interface Technology Model 736 Interactive Terminal

Designed primarily for such business and industrial applications as inventory control, laboratory test data collection and check cashing, the final configuration of the 736 varies depending on the application. The firm noted it can supply the terminal with custom keys and legends to suit the application.

The basic model with eight LED displays sells for $670. The device can be obtained from the firm at 10500 Kahlmeyer Drive, 63132.

ASC Programmable Controller Based on 8080 Microprocessor

ST. CLAIR SHORES, Mich. – A programmable communications terminal controller is being offered by Applied Systems Corp. (ASC) for custom implementation in terminal control, data concentration, message buffering and communications switching applications.

Using an Intel 8080 microprocessor system, the controller is modularly designed for on-line operation with medium- or high-speed communications networks. It includes options for terminal selective calling, automatic answering, data translation, error checking, peripheral clustering and line multiplexing functions, the company said.

The firm added that the device contains communications interfaces for dial-up lines or private-line polling systems and multiple interrupts to control one or more terminal devices including teletypewriters, keyboards, printers, CRTs, tape cassettes, card readers or floppy disks.

Communicating at rates up to 9,600 bit/sec and using synchronous or asynchronous modems or interface adapters, the controller has a binary synchronous communication (BSC) option that permits communication between IBM BSC systems using RS-232C-compatible modems and non-IBM-compatible terminal devices over phone lines.

Standard ASC controller configurations are said to accommodate one to eight TTY-compatible Ascii terminal devices and to utilize EIA RS-232C or current loop interfaces.

The firm noted alternates for IBM 2741- or Ebcdic-compatible terminals are also available using programmable read-only memory program conversion options.

In addition, typical terminal data rates are 110-, 300-, 1,200-, 2,400- and 4,800 bit/sec, with special features designed for intermixed terminal types operating from a single controller.

Basic controller prices range from $1,000 from the firm at 26401 Harper, 48081.

Terminal Transactions

Mini Bee 4 Operates At 9,600 Bit/Sec

SALT LAKE CITY, Utah – A silent replacement for buffered teleprinters with asynchronous data transfer at rates to 9,600 bit/sec is available from Beehive Medical Electronics, Inc.

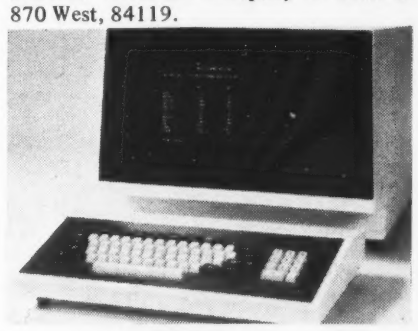
The Mini Bee 4 features line and block transmission, addressable cursor, upper- and lower-case character generation, display operation in format or character mode and all teleprinter-compatible codes.

The company also noted that the device has a detachable teleprinter-style keyboard with an 11-key numeric pad.

Operating on-line in half- and full-duplex modes, the terminal has a display capacity of 80 characters by 25 lines, line feed, carriage return and scrolling. The device is also RS-232C-compatible, according to the firm.

Composite video is optional.

Selling for $2,395, the terminal can be obtained from the company at 2600 S. 870 West, 84119.



Mini Bee 4

Bits & Pieces

NCR Micr Unit Stores Data on Tape Cassette

DAYTON, Ohio – A magnetic ink character recognition (Micr) data capture unit, which magnetically reads the Micr line on documents and records the information on magnetic tape cassettes, is now available with NCR's 775 proof-encoding system.

The cassettes permit data transmission to a central processing point over standard communication lines, or processing can be done on-site on an NCR Century 399 computer, NCR said. The data can also be converted to industry-compatible tape.

The unit rents for $290/mo and has a purchase price of $7,500. Initial deliveries are scheduled for the third quarter of 1975.

Hand-Held Humidity Meter Monitors DP Center Moisture

CEDAR GROVE, N.J. – "Humi-Chek" is an all-electronic, hand-held humidity meter that measures relative humidity in seconds, according to Beckman Instruments, the meter's vendor.

Moisture-related problems, such as dimensional changes or static charge build-up on card decks, are identified over a range of 20% to 90% with an accuracy of 2% and repeatability of 1%, the vendor said.

Humi-Chek does not require wicks, which can become dry or clogged, or hair filaments or membranes, which can become "fatigued", Beckman noted.

Since no "swinging" is necessary, as with a sling psychrometer, the meter can be used in confined quarters.

Humi-Chek costs $172, including carrying case, from the firm at 89 Commerce Road, 07009.

Computer Room Environment Unit Less Costly Than Predecessor

TORRANCE, Calif. – The Mark V Data-Aire computer room environmental control system from Lanco-Supreme, Inc. is a lower-cost version of the company's Mark IV model, according to the vendor.

A control panel alerts the user to malfunctions of the system and has more diagnostics to trace the problem to particular components in the system.

Temperature is controlled to within ± 2 degrees and relative humidity to within ± 5%. Dust particles are removed with an efficiency up to 89%, the company added.

Systems are available in 5-, 6-, 8-, 10-, 15- and 20-ton capacities with a choice of water-cooled, chilled water or air-cooled operation.

The Mark V ranges in cost from $2,000 to $5,000 from the company at 1942 W. Artesia Blvd., 90504.

A Look at Tape Drives—Part 1

Days of Buyer's Market Nearly Gone

By Vic Farmer
Of the CW Staff

It was just about five years ago that independent vendors started to tumble over each other to provide the end user with tape drives at prices lower than those of IBM.

The 2400s were overpriced and everyone knew it . . . even IBM. So everyone got into the act to buy, repackage and resell a 2400-type tape drive from one of nearly a dozen firms actually manufacturing them. And within a year "private brand" tape drives were coming out of the woodwork.

The recession in the early '70s shook the tree, but IBM's announcement of the lower priced and slightly higher performance 3400 series, along with the introduction of long-term leases, was the death knell to a flourishing independent tape drive market.

Today there are only six independent manufacturers of tape drives for the end user and a small group of leasing companies that market tape drives as part of a complete package of third-party leased mainframes and independent peripherals – or as complete lines of independent peripherals.

Of these six remaining independent tape drive firms only a few have aggressively tackled IBM's 6,250 bit/in. 3420-4, 6 and 8 tape drives.

Perhaps this eroded marketplace can be summarized with a review of the IBM strategy that came to light during the IBM/Telex case. In 1970 IBM was seriously concerned with what it considered a major problem – "higher price for comparable function."

Independents were announcing tape drives close to 20% less in price and making heavy inroads in the plug-to-plug market.

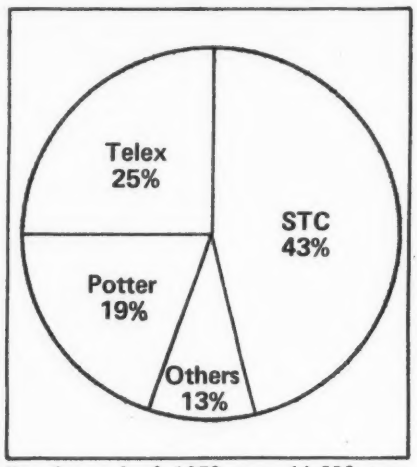
The company's management concluded that a dominant market share could be maintained only if:

- IBM's peripheral price umbrella was lowered.
- Technology development was accelerated.
- The firm continued to offer increases in price/performance in new peripheral announcements.

The strategy was complicated by the desire to move users to on-line storage devices, but at the same time to protect the 1/2-in. tape market.

IBM was also concerned with the independent gains because they made the end user more independent and "created a buyer's market."

This buyer's market led to negotiated terms that included quantity discounts, long-term leases, special maintenance agreements and cancellation privileges.



By the end of 1973 over 11,500 tape drives from independent vendors were installed on IBM computers in the U.S., according to statistics from International Data Corp.

Unit	Density Bit/In.	Speed In./Sec	Data Rate Kbyte/Sec	Announcement Date
726	100	75	7.5	1952
727	200	75	15	1953
729 II	556	75	41.7	1958
729 IV	556	112.5	62.5	1958
729 V	800	75	60	1961
729 VI	800	112.5	90	1961
7330	556	37.5	20	1961
7340-1	1511	112.5	170	1961
7340-3	3022	112.5	340	1964
2401-1	800	37.5	30	1964
2401-2	800	75	60	1964
2401-3	800	112.5	90	1964
2401-4	1600	37.5	60	1965
2401-5	1600	75	120	1965
2401-6	1600	112.5	180	1965
2415-1 (2dr)	800	18.75	15	1965
2415-2 (4dr)	800	18.75	15	1965
2415-3 (6dr)	800	18.75	15	1965
2415-4 (2dr)	1600	18.75	30	1965
2415-5 (4dr)	1600	18.75	30	1965
2415-6 (6dr)	1600	18.75	30	1965
2420-5	1600	100	160	1968
2420-7	1600	200	320	1968
3410-1	1600	12.5	20	1971
3410-2	1600	25	40	1971
3410-3	1600	50	80	1971
3420-3	1600	75	120	11/70
3420-5	1600	125	200	11/70
3420-7	1600	200	320	11/70
3420-4	6250	75	470	3/73
3420-6	6250	125	780	3/73
3420-8	6250	200	1250	3/73

The history of IBM's tape drives is reviewed in this table of the firm's major units.

IBM's affinity for single source purchasing by the end users was also jeopardized because an open market made possible standard purchasing techniques based on best price/performance. IBM saw the eventual destruction of its "account control" at the same time it needed to increase its sales coverage requirement.

Plug-to-plug peripherals also made comparison shopping practical. The documents even went as far as to acknowledge that "mixed maintenance works," and in one case the firm blatantly stated, "There is no evidence that advanced designs show up in performance."

Well it is obvious that over the last five years IBM's strategy has cut the competitive price edge the independents once had and at the same time had weeded out the weak sisters and served to control an emerging buyer's market.

The latest announcement of the 3850 mass storage facility is the culmination of a long-range goal to provide users with on-line storage with reduced labor expense of constantly changing tapes. But it increased the level of technology necessary for the independents to compete, complicated the interface arrangements for the independent replacement vendors and reestablished parts of a single source market.

While it is true that the 3850 tape cartridge unit is a large and complicated device (up to 472 billion bytes on-line), the IBM/Telex documents noted that a smaller unit using the same basic technology was also in the works.

The 6,250 bit/in. tape drives, on the other hand, represent about three times the effective storage of the preceding 3420-3, 5 and 7 tape drives. Only one independent has installed equivalent drives.

The 6,250 bit/in. tape drives are here to stay and, conservatively speaking, may form the basis for a tape standard for the next five years.

Part 2 of this series will look at user reactions to 6,250 bit/in. tape recording.

Minis in Business—Part 4

Use as Front End, Controller, Text Editor Possible

By Theodore A. Franks
Special to Computerworld

The user who is independent-minded enough to apply minicomputers to business DP tasks rather than just to follow the path to ever larger central mainframes can both save money and boost the effectiveness of his DP system.

Such minicomputer applications include:

- Offloading of present systems to avoid explosive and costly upgrades.
- Adding fourth-generation peripherals for a system, especially in the case of second- or third-generation processors abandoned by large system manufacturers.
- Affording the user control of his destiny in regard to the life of his present system and associated software investment.

An example of one use of minicomputers in business DP is as a communications front end in a CRT terminal system.

Interesting Applications

More and more mini-based communication configurations are replacing earlier second-generation communications subsystems of very limited throughput and flexibility.

One interesting application involves a Military Supply Corps order inquiry and entry system. The minicomputer interfaces to the existing host system through a computer-to-computer channel which allows efficient exchange of whole message blocks.

Configured with the mini is a communications scanner for servicing up to 16 asynchronous or synchronous lines. Seven 1,800 bit/sec lines are required in this application. A total of 30 CRT terminals are connected through private multidrop lines, with a maximum of four CRTs connected to any one line.

The mini-based front end completely handles message buffering into blocks, polling of the terminals for service, error retry, determination of active terminal status on power-up and hardware maintenance aids such as echo checking of interfaces.

The ability of the front end to handle these functions resulted in commensurate offloading of the host system and reductions in host core residency. System growth in terms of adding more lines and terminals and faster lines is available for the future.

Formation, Inc. wrote the software for the mini in about nine man-months and assisted the user in host processor software changes to accommodate the new block transfer interface.

Another interesting application is an off-line text editing/page composition system put together by Delta Resources, Inc. for New York Telephone.

Three local or remote alphanumeric/graphic terminals are interfaced to a mini featuring a large disk data base and extensive magnetic tape facilities.

Text and graphic data are stored on six IBM 3330-type disk drives. This represents 600M bytes of storage with future expansion capability to 1.6 billion bytes.

The magnetic tape subsystem employs IBM 3420-equivalent drives and handles journalizing, disk loading/unloading, tape sorting and general utility. Smaller moving head disk equipment is used for program storage. Conventional line printer, card reader and paper tape units round out the peripherals.

The software has been written for the end user by a software house which is acting as prime contractor. The operating system employed, however, is a standard package from the original mini manufacturer.

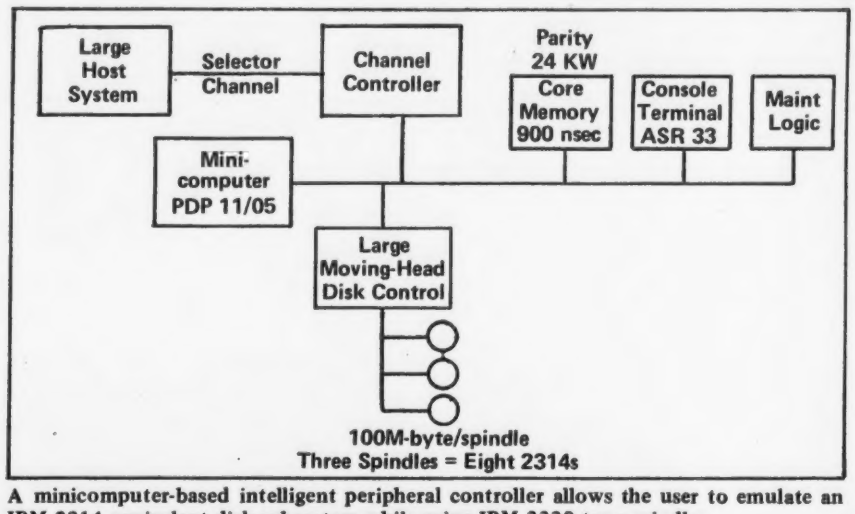
The operating system and application packages run in a 120K-word parity core memory. The memory size, use of 3330-equivalent disk drives and 3420-like tape drives indicate the extent to which a mini system can grow.

Mini as Controller

At the Cleveland Twist Drill Co. is an application that uses a mini as an intelli-

(Continued on Page 28)

Miniworld



A minicomputer-based intelligent peripheral controller allows the user to emulate an IBM 2314-equivalent disk subsystem while using IBM 3330-type spindles.

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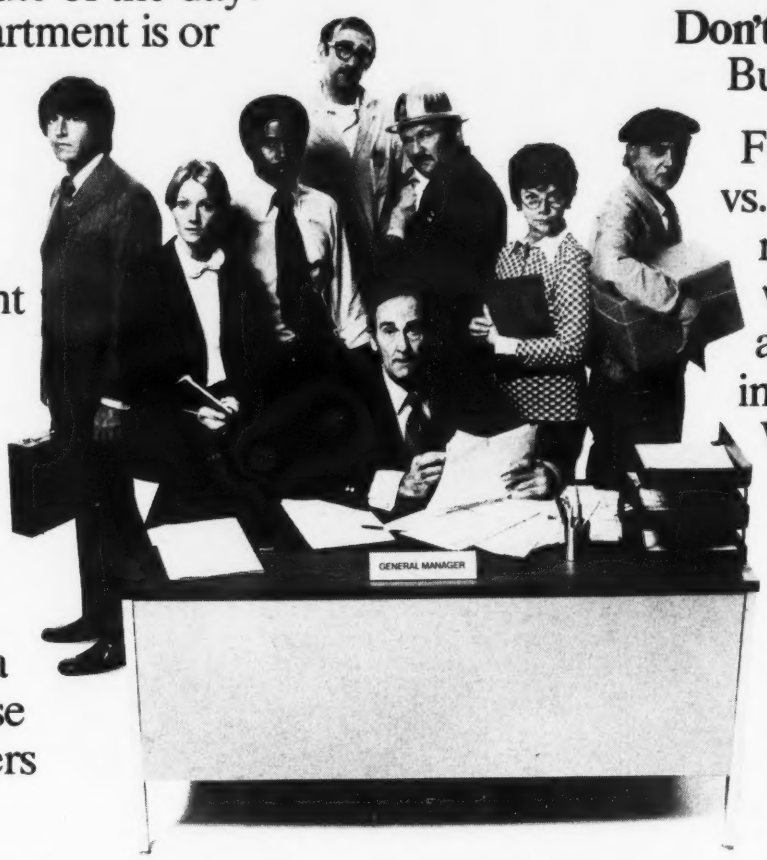
What would it mean if your key people could know the status of every department in your company any minute of the day? No matter where the department is or what it does? No matter what kind of business you're in?

On top of that, what if each individual department not only knows where it stands on an up-to-the-minute basis, but also knows the status of all related departments?

What if we told you General Automation has a brand new answer for these questions and a lot of others just like them?



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DATA MANAGEMENT SYSTEMS BY
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Miniworld

Disk Drive Links to 13 Minis

SUNNYVALE, Calif. – The IBM-compatible AED 3100-P floppy disk drive system from Advanced Electronics Design, Inc. (AED) has a programmable formatter that permits each of up to four disk drives to READ or WRITE in different formats, the vendor said.

The AED 3100-P can be interfaced to 13 minicomputer lines, including all Digital Equipment Corp., Data General, Interdata and Varian models, the Texas Instruments 980A, Computer Automation minis and Intel's Intellec 8/Mod 80 microprocessor, according to AED.

256-Word Sectors

The formatter is said to allow one drive to contain the minicomputer operating system written in 256-word sectors while the other drives process IBM standard 64-word sectors. An automatic Initial Program Load (IPL) permits loading the minicomputer bootstrap into memory from the floppy disk.

Compatible With 3740

Each disk can store 128K 16-bit words in IBM format and is fully compatible with those generated by the IBM 3740, the firm said. Access is 10 msec/track. Data is transferred at the rate of 66.7 msec/word.

A single drive AED 3100-P costs $2,600 plus $350 for a programmed I/O interface, or $550 for a DMA interface, from the firm at 754 N. Pastoria St., 94086.

Extends Life Span

Floppy Has Noncontact Head

RICHARDSON, Texas – The PD/300 floppy disk system with noncontact reading head can provide the same media life span as hard disk systems, according to its vendor, Fort Communications Corp.

The disk system is now compatible with all Computer Automation processors and Digital Equipment Corp.'s PDP-11 line, Fort stated.

The PD/300 system controller is a half board accommodating up to eight drives. I/O program capability, Initial Program Load (IPL), Autoload and Direct Memory Accessing (DMA) are standard features. Only three instructions are required for a DMA sector transfer.

The disk drive has a rotational speed of 3,600 RPM, giving it much higher true data access (TDA) times and transfer rates than other floppy disk drives, the vendor said.

Average TDA times (defined as elapsed time between receipt of seek command to beginning of disk transfer) are 100 msec, adjacent track seek; 210 msec, mean 31 track seek; and 300 msec, maximum 63 track seek, the firm said.

The disk system transfers accessed data at the rate of 2,540 kbit/sec in both the I/O and DMA modes.

Each disk has a 2.16M bit capacity with a 17.26M bit capacity in an eight-drive system.

Overlapped seeks, hardware seek-complete interrupts and a double-buffered data channel enhance the system's throughput, the firm claimed.

Standard software includes a diagnostic program, software formatter and I/O driver at the sector level. Options include seek optimizer, disk bootstrap and file service.

The PD/300 costs $3,500 from the firm at 710 N. Central, 75080.

Text Editing One Use Of Mini in Business

(Continued from Page 25)

gent peripheral controller – in this case, emulating a third-generation IBM 2314-equivalent disk subsystem with fourth generation, IBM 3330-type spindles.

The disk emulator was designed to be plug-compatible in a software sense with the 2314 subsystem it replaces. Primary features of the emulation include: mapping of three 2314 spindles onto one 3330; improved read/write reliability and use of 11-bit burst error correction code; performance improvement of 10% to 30% through faster head positioning and reduced latency; and increased data transfer rate into the host processor's selector channel – approximately 600K bytes.

Other features are better reliability; capability for off-line functions such as disk copy and surface analysis/formatting; and accumulation of statistical information regarding subsystem activity and error counts.

The disk emulator has proven to be a viable method of upgrading a third-generation system with the latest disk technology, without any software changes.

The use of the minicomputer allows dynamic interpretation of the selector channel commands, translation into 3330-equivalent functions and buffering of the basic data rate of 806K bytes down to the maximum capacity of the channel. The emulation software required approximately 18 man-months of effort.

In summarizing new trends, the large mainframe manufacturers seem to be reacting to user pressures in basically two directions:

- Large users with an increasing load are upgrading to more complex, virtual, multiprogrammed and, of course, costly system configurations.
- Large users with noncentralized needs, or relatively small users, are moving to various versions of distributed processing power.

Certainly the upgrade route does not guarantee more efficient operations. The distributed processing concept is a reinforcement of the role minicomputers can play. Restructuring large systems into smaller, more manageable parts is entirely practical and should be considered in user system planning.

Plans to use distributed processing should include looking at all possible vendors as sources of equipment. This "benevolent" process of advancement by the large system manufacturers can be made less painful and costly by judicious application of minicomputers to business DP.

The rewards in terms of dollar savings and effectiveness of DP investment are real, but only if the user will risk being different.

Franks is a vice-president at Formation, Inc.

CI Notes

Serrata Found Guilty

SAN JOSE – The first of the "San Jose 11" to go to trial has been convicted here for stealing trade secrets from IBM.

Ramon Serrata, a former IBM employee, was found guilty of the charge of two counts of grand theft of trade secrets by a jury recently and will be sentenced later this month.

Of the original 11 implicated in what authorities described as a multimillion dollar conspiracy, charges have been dropped against six defendents and one has pleaded guilty. Serrata was the first to be found guilty by a jury.

Charges are still pending against three defendents.

CLA Forms IBM Policy Unit

WASHINGTON, D.C. – The Computer Lessors Association (CLA) has formed an IBM Policy and Practices Committee that will deal with IBM on its practices that affect the leasing industry.

"Many IBM actions have caused great concern within our industry and, on behalf of the membership, my committee will coordinate these issues directly with IBM," said James P. Hassett, chairman of the committee and president of Diebold Computer Leasing, Inc.

He noted that until now a united approach among lessors to various IBM policies has generally been lacking. This committee was designed to evaluate and assess how IBM practices affect these firms and to present a unified view to IBM, he said.

In addition, the Tunney bill [CW, Oct. 30] would give such a group the right to make its position known on a consent decree before it is effective.

"The feeling was that we should take stock as to what our position should be in the event" there is a consent decree between IBM and the Justice Department, Hassett said.

Russians, L.A. Exchange Views

CW West Coast Bureau

LOS ANGELES – Five Russian civic and data processing officials recently visited the Los Angeles Municipal Information System as part of an exchange program to learn more about adapting computers to complex city management problems.

P.N. Tkachenko, director, main scientific research computational center, Moscow City Council, said there was a trend in Russia to develop systems and data banks for more financial, construction, transportation and policy areas.

Tkachenko expressed the hope that the technology interchange would be mutually beneficial, citing the good equipment in the U.S. and the good mathematics tradition in the USSR.

Before visiting Los Angeles, the Russians also visited some New York City installations.

But Lags on 'Competitive Dollars'

IBM Takes Top Spot in Loyalty Study

By Molly Upton
Of the CW Staff

WALTHAM, Mass. – IBM has again taken first prize among mainframers for its user "brand loyalty," but lagged behind most of the others in "competitive dollars" – the ratio of the net value of 1973 installations to the "old" value of systems installed at the beginning of 1973, according to a study by International Data Corp. published in *EDP Industry Report* (EDP/IR).

A general upsurge in the loyalty to present suppliers at single vendor sites characterized 1973. IBM's rating rose from 92% in 1972 to 94%. The average for non-IBM suppliers hit 80% for the first time, the study showed. Thus, for every 100 single vendor IBM sites, only six users installing a new system failed to stick with IBM.

Burroughs' loyalty percentage rating at single vendor sites rose from 88% to 90%, and NCR's soared from 76% to 88%, while Honeywell's declined one point to 85%.

Univac's rating went from 64% to 61% and the "others" category, which includes general-purpose machines from Control Data Corp., Digital Equipment, Friden, Memorex and Xerox, showed a drop from 58% to 37%.

EDP/IR forecast Univac's customer loyalty rating will climb to 76%, while others will reach 50% and IBM, 95%. Honeywell's will also climb, to 88%, but NCR's will decrease to 83%, the study said.

IBM lost more single vendor installations than it gained, although it still gained more than any other single maker. IBM lost 148 customers to competitors and gained 112 from other vendors.

Burroughs emerged as the high climber, gaining 62 customers and losing 12, while Honeywell gained 74 and lost 50.

NCR added 13 and lost 33, while Univac (RCA) gathered 27 sites and lost 62. The others showed 41 customers gained from others, while losing 24.

Dollar Ratings

Burroughs also walked off with first place, topping even IBM, in EDP/IR's dollar competitive and loyalty ratings, at both single and multivendor sites.

Burroughs' dollar competitive rating was .60, compared with Honeywell, .27; NCR, .20; Univac, 0; others, .08; and IBM, .10. This figure "represents 'captured' dollars – the difference in value between his year-end and year-begin base," the report explained.

Therefore, for "every dollar of Burroughs equipment installed among the sites getting a new computer in 1973 there was $1.60's worth of Burroughs equipment in the field at year's end."

Burroughs scored a dollar loyalty rating of 1.29, followed by NCR, 1.15; Honeywell, 1.08; IBM, 1.07; Univac (RCA), 94; and others, .89.

The loyalty rating represents dollars that stayed within or were generated by a firm's loyal customer base.

Thus for Burroughs, "every 'loyal' dollar generated 29 cents," the report said.

Each mainframer seems to have replaced about the same proportion of its customer base, with an average of one system out of four being replaced, the report indicated.

"The value of equipment at migrating sites represents about one-third the domestic installed base."

IBM and Univac appeared to be going after the same marketplace, as the value of their average systems removed was $700,000 compared with $900,000 for systems installed.

Burroughs and Honeywell each removed systems worth an average of $500,000 and installed units valued at $800,000.

NCR upgraded from an average of $100,000 per system removed to $200,000 in new installations. However, among other makers, the prices dropped from $1.8 million to $1.6 million.

Mixed vendor sites are becoming more common, according to the study. Every mainframer except NCR showed a steady decrease in the ratio of net value of 1973 shipments to single vs. multiple vendor sites, EDP/IR said.

Admittedly weighted by IBM's 5:1 ratio, the industry average is also 5:1. Burroughs' ratio is 2:1; Univac, 1:1; NCR, 10:1; and Honeywell, 5:3, according to the newsletter.

The study looked at 3,396 sites, compared with 3,134 sites in 1972, and excluded sites acquiring their first computer. The forecast for 1974 is based on 1,098 sites.

IDC may be reached through P.O. Box 915, 02154.

GSA RFP for One Mini Source Draws Widespread Criticism

WASHINGTON, D.C. – Industry sources here are in a furor over a recent General Services Administration (GSA) request for bids for a single minicomputer system to meet the needs of most government agencies.

A matter of industry-wide dispute is the request for proposal (RFP), issued by GSA on Sept. 25, 1974, calling for a minicomputer with a wide variety of specific characteristics – including word size, memory cycle time, accumulators, memory protection, software, benchmarking, languages and communications cpabilities.

The RFP called for a one-year contract, with options to renew up to five.

Sources said as many as nine minicomputer manufacturers and members of the Computer and Business Equipment Manufacturers Association (CBEMA) have met with GSA officials hoping to persuade them to abandon the plan on grounds that a single minicomputer cannot satisfy the wide range of requirements within a single agency, let alone the entire government.

The view expressed by Vico Henriques, CBEMA director for data processing, seemed to reflect industry-wide opinion: "Determining the best way of satisfying the mission of any agency belongs to the agency involved, not the GSA. GSA means well – they want to shorten the procurement cycle. But as we told the GSA, we believe the best possible equipment choices are provided to the government through the whole range of choices that are commercially available," he said.

One solution which may satisfy both users and vendors is to have the GSA sign a mandatory use contract with a single vendor, but at the same time decentralize the responsibility for interpreting what equipment will suit an agency's needs.

GSA May Modify Paperwork Rules On 'Alternate' Pacts

WASHINGTON, D.C. – As a means of easing paperwork and speeding procurement for agencies that cannot meet their needs through existing mandatory use contracts, the General Services Administration (GSA) is considering changing the policy requiring agencies to request formal GSA approval before proceeding with alternate plans.

Mandatory use contracts are agreements reached between the GSA and a vendor for a guaranteed number of units at a specified price.

Unlike the Federal Supply Contract, which sets a government price without guaranteeing the number of units that will actually be purchased, the mandatory use contract guaranteed both price and minimum number of units. The higher the unit guarantee, the better the price.

Under the new procedure, the formal product assessment and report writing would still be required but documentation could be kept within the agency rather than filing with GSA.

CDC Subsidiary Unites Lessors

BALTIMORE – Control Data Corp.'s (CDC) financial subsidiary, Commercial Credit Co. has consolidated its five U.S. leasing subsidiaries into one organization, CCEC/McCullagh.

Currently CCEC/McCullagh provides over $280 million in financing and leasing for computer systems, peripherals and other types of DP equipment and has a total of more than $1.2 billion in capital equipment leases and loans on its books, the firm said.

"By consolidating the capital equipment financing services of several Commercial Credit subsidiaries into one organization and establishing a national network of financing and leasing centers, we can provide the right type of financing arrangement to meet local customers' specific needs," said Fred W. Meier, senior vice-president, business services.

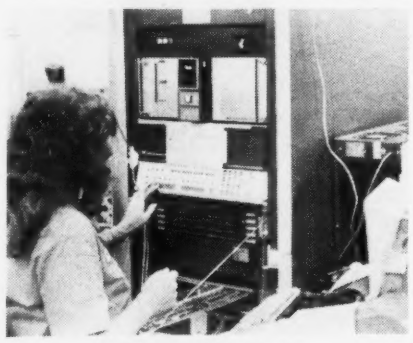
'75 Forecast as Period of Consolidation for CAI

By Nancy French
Of the CW Staff

IRVINE, Calif. – Computer Automation, Inc. (CAI) expects 1975 to be a year of consolidation, Sol Zasloff, vice-president of marketing, said in a recent interview.

CAI's order rate has been "flattening," he explained.

To cut costs, CAI laid off 6% of its employees last quarter and, although business is actually better than last quarter, Zasloff projects profits will be about 7% before taxes, down from their normal 17% to 19% before taxes.



CAI's Capable Tester

Other minicomputer manufacturers may have to be content with the same figures, he added.

CAI specializes in simple, inexpensive minis that suit the general computing needs of a wide variety of OEM system builders, Zasloff said.

Reliability Important

Describing CAI's computer as the first 16-bit machine to sell for under $1,000, Zasloff said it is "efficient and reliable" and comes with a one-year guarantee.

Reliability is important, according to Zasloff, because maintenance comes directly out of profit.

"The machine is efficient," he said, "because efficiency saves memory, thereby saving space, and for our customers who put the minis inside their cabinets with a lot of other electronic and electro-mechanical gear, space is more important than speed.

CW Photos by N. French
Sol Zasloff

"Our Fortran compiler is pretty good from the standpoint of speed and sensational from the standpoint of space," he said.

While domestic orders for CAI's Naked Minis are down, business is holding firm in some of its foreign markets, Zasloff said. He expects to firm up a contract with a system manufacturer in Sweden very soon, he added.

"We're in the volume buiness," he said. "I'd rather sell 100 systems at $3,000 than three systems at $100,000.

"That's a whole different kind of business," he explained. "We concentrate on making sure our customer benefits, because if he makes money, we make money too."

The company's Capable Tester, aimed at the end-user market, is an automated system for testing printed circuit boards.

Capable, which can be run by "just about anybody," according to Zasloff, gives a simple GO/NO GO readout in a couple of seconds and displays a list of the most probable board faults on CRT terminals incorporated into the system.

Over 40 Vendors Set To Exhibit at Caravan

NEWTON, Mass. – Software will represent the largest growth area in terms of new exhibitors at the 1975 Computer Caravan, which will feature displays in nearly all sectors of data processing.

With over 40 vendors, the Caravan exhibits will range from minicomputers and small business systems to terminals, data communications gear, software, media and supplies.

The 1975 Caravan itinerary includes Atlanta, Philadelphia, Hartford, New York City, Cleveland, Chicago, St. Paul, Seattle and San Francisco, in that order, beginning Feb. 24. The Caravan is sponsored by *Computerworld*.

The marketing philosophy behind this schedule is to visit the five prime marketing areas in the country, plus four additional markets which change each year, explained Neal Wilder, CW's vice-president for marketing and sales.

The Caravan will not be visiting Los Angeles this year he noted, since the National Computer Conference will be held there in the spring.

"The Caravan is a promotion tool," Wilder stated, "but more than that, it's a whole marketing platform for a company.

"I think that a number of companies are overreacting about being hesitant to make commitments to the Caravan," he said, adding that "a recession is a time when aggressive marketing is very important.

"In fact, the American Business Press has recently completed a study showing that companies which continued to promote during the last recession (1969-70) were the ones who came out of it in the best shape."

Most exhibitors staff their booths with local sales representatives. This allows attendees to discuss problems and solutions with personnel who will still be on hand long after the Caravan has moved on to the next city, Wilder noted. In addition to local staff, many companies will have headquarters marketing and technical experts in attendance.

GA Puts SOS on Shelf After Supplier Withdraws

ANAHEIM, Calif. – Barely a year after General Automation, Inc. (GA) launched its gamble with silicon-on-sapphire (SOS) technology [CW, Dec. 19, 1973], the company is returning SOS to the development stage.

Rockwell International, Inc., which was to provide GA with SOS chips, decided to withdraw from the commercial marketplace for SOS products, although it is continuing R&D work.

This has forced GA to scale down its priorities on these efforts, Raymond J. Noorda, GA president, commented.

Rockwell's decision will impact the LSI 12/16 and LSI 16 microcomputer products lines, Noorda said. But the decision to postpone SOS-implemented products will have little impact on GA's present sales volume, he added.

"We have already contacted those customers committed to our LSI 12/16 and are working on alternative system solutions to their problems using our interfaces with conventional microprocessor hardware, while we continue development on our SOS process," Noorda noted.

"In addition, although we have never been committed to deliveries of the LSI 16 in quantity, we should be able to meet our customers' needs for this product, implemented in a different process technology, near our original timetables," he said.

The LSI-12/16 incorporated a processor on a single semiconductor chip.

Low Yields

The problem with SOS was the lack of sufficient yields by Rockwell. GA expects the problem should be solved within two years.

"Although we have obtained working models of both SOS microcomputers, we have been unable to achieve high enough yields from the SOS process to allow us to deliver our microcomputers cost-effectively in production quantities," Noorda said.

"And the withdrawal of our major SOS source from the commercial marketplace has forced us to scale down our priorities on these efforts," he added.

However, during this time GA has been investigating other process technologies and "other implementations on our LSI designs in parallel with our SOS work."

DEC Canadian Unit Sets Revenue Record, Boosts Year Earnings

Special to Computerworld

OTTAWA – Digital Equipment Corp.'s (DEC) Canadian subsidiary, Digital Equipment of Canada Ltd., reported record sales for the year ended June 29.

Revenues were $35.4 million compared with $22.1 million for 1973, an increase of 60.4% Export sales accounted for $12.7 million, compared with $8 million in the previous year, for a 58% increase.

Earnings grew to $1.4 million from $767,075 in 1973.

The Decsystem-10 accounted for $5 million of the firm's total sales in Canada.

General Manager D.J. Doyle attributed the growth to a wide range of factors which included increased use of minicomputers in the Canadian resource industries and in data communications networks, as well as to "an endorsement of the company's approach to the Canadian market.

"We have been investing heavily in increased services and increased manufacturing facilities since the 1970 recession," said Doyle, "and we are now in a position to respond quickly and effectively to the emerging markets."

International News

Japanese Retail Chain Puts in Credit System

LOS ANGELES – A credit authorization system manufactured here is expected to eliminate the long delays at cash registers faced by customers waiting to pass credit checks at Marui Department Stores in Japan.

The 30-store Tokyo-based chain purchased the system from TRW Data Systems to handle cash, installment credit, bank credit cards and discount rate sales in which different discounts are computed on the basis of the store's prior agreement with the customer's employer, a TRW spokesman commented.

Similar to current TRW retail communications systems used in U.S. and Canadian operations, the Marui system verifies the customer's account status through immediate inquiry from a TRW Model 4103 terminal to the central computer, a Datapoint 2200.

The system was developed jointly by TRW and Chiyoda Joho Kiki Co Ltd. (CJK), a manufacturer of electronic products and systems and TRW's distributor in Japan.

While TRW contributed the basic communications software package, the terminal controllers and the communications electronics, CJK built its own point-of-sale electronic cash registers into the Model 4103 terminal subsystem.

CJK will also supply any additional sales, customer service and systems support, the spokesman noted.

Three stores had been converted to the on-line system by the end of June.

ICL Expands Down Under

SYDNEY, Australia – With the 2903 computer system as its advance guard, ICL appears to be rapidly penetrating and expanding its Australian and New Zealand market share.

Since April 1973 about 85% of the small machines have been ordered, of which about 75% have gone to first time computer users, a report in *Computer Weekly* said.

During one week, the company was averaging an order a day, from such users as The Gospel Film Industry, Hero Office Services and The Broken Hill City Council.

Foreign Orders & Installations

The University of Bologna, Italy, has ordered its second Control Data Cyber 76 Model 12 and a Cyber 72 Model 14. The systems will be used to provide increased services to a current network of 46 terminals.

Measurex Corp. will install two computerized papermaking control systems at Bowaters UK Paper Co. Ltd. in Kent.

Chartered Bank of Hong Kong has ordered 100 NCR 270 electronic teller terminals and associated communications equipment as part of a program to expand its on-line system among branch banks. The order is valued at $1.3 million.

Iberia Airlines of Spain has ordered over $700,000 in Incoterm intelligent terminal equipment as part of its passenger reservation system.

The Government Insurance Office of New South Wales, Australia, has ordered two Honeywell Series 60 Model 66/20 computers for an on-line insurance information system.

British Columbia Hydro and Power Authority has ordered Interdata Model 7/32 minicomputer systems.

German automaker Bayerische Motorenwerke A.G. (BMW) has ordered a Hewlett-Packard 3000 Model 100 system for use in designing and testing new automobiles.

A Computer Technology Modular One system has been installed at the Ministry of Defense's Royal Armament Research and Development Establishment in Kent, England.

Caisses d'Epargne, a large French savings bank, has ordered two Honeywell Model 66/40 systems, valued at $3.5 million.

Litton Industries will install 104 Sweda sales register terminals and associated equipment in one of Italy's La Rinascente department stores.

Federal Procurements, Bank Aquisitions

Adapso Makes Position Known on Variety of Issues

By Molly Upton
Of the CW Staff

NEW YORK – The Association of Data Processing Service Organizations (Adapso) has been sending out position papers and advice to government agencies on a variety of topics ranging from federal property management regulations on computer services to acquisition of DP service firms by operating banks.

Adapso endorsed proposed clauses in the General Services Administration (GAO) regulations that eliminate contractor responsibility regarding implied or expressed systems capabilities.

These "provisions should go far toward encouraging the private DP industry to expand its offerings of complete services to government agencies at lower cost and with greater efficiency," Adapso wrote the GSA Automated Data and Telecommunications Service.

However, Executive Vice-President Jerome L. Dreyer pointed out, the proposed amended procurement procedures specifically exclude applications programs, although they include hardware, software products and custom systems software.

"We think it is a serious mistake to treat applications programs differently from system software with regard to procurement procedures. Customized system software can be as unique to a specific requirement as applications programs," Dreyer wrote the agency.

In addition, Dreyer noted, the requirement for at least one responsive bidder in competitive procurements could result in agencies creating fake competitive situations.

The agency should consider a sole bid if the competitive procurement was adequately publicized, he said.

In a letter to James E. Smith, comptroller of the currency, Dreyer criticized that agency's posture on the acquisition of DP service companies by national banks.

He further asked for a review of policy toward bank acquisitions as a way of avoiding future acquisition attempts by banks into the DP service field.

When the comptroller permitted the Chase Manhattan, N.A., New York, to acquire the controlling interest of Interactive Data Corp., it "evaded the authority and jurisdiction of the Federal Reserve Board (FRB) when it failed to obtain the prior approval of the FRB's board of governors," Dreyer observed.

This action, he said, was contrary to the spirit of Regulation Y, which requires bank holding companies to receive FRB approval on acquisitions.

"The comptroller, however, in its interpretation of the acquisition by an operating bank rather than a holding company has now made it possible for other national banks to make similar acquisitions in this indirect fashion," Dreyer said.

ABA Opinion Denounced

In a separate action, Adapso asked the American Bar Association (ABA) to rescind its Professional Ethics Opinion 1267 because it is discriminatory to the DP services industry.

Opinion 1267 states, "The client should be informed in advance that an outside DP firm is to be employed for bookkeeping, accounting, data processing or other legitimate purposes. If the client directs otherwise, then the services of such an outside agency cannot properly be utilized."

Dreyer told the ABA that "the singling out of data processing service firms – in contrast, for example, to a stenographic, investigative, duplication, accounting, bookkeeping, janitorial or delivery service – must inevitably lead the client to believe that there is some special risk or danger in the DP area when the precise contrary is the case. Almost alone among these outside services, the DP industry and its individual members have codes of ethics designed to assure the security you seek."

Seat Requested

Adapso also asked President Ford to name Bernard Goldstein to a seat on the new National Commission on Electronic Funds Transfer [CW, Nov. 27].

Goldstein is chairman of Adapso's Committee on Electronic Funds Transfer. "It is most important that a knowledgeable and articulate spokesman from the computer services industry serve on the commission to insure balance of viewpoints," Dreyer wrote.

"This is particularly important if electronic funds transfer is to link together banks, clearinghouses, retailers and other commercial organizations into a nationwide (and perhaps ultimately worldwide) integrated economic structure when a conscious and aggressive effort will be required to prevent serious anticompetitive effects," Dreyer concluded.

Position Announcements

Director of Computer and Institutional Studies serves in a staff capacity reporting to the president of the college. Supervises operation of computer center and development/maintenance of comprehensive, institutional data base to support informational needs of administration and faculty. Staff of five full-time personnel. Computer center is primarily operated as remote job-entry terminal with emphasis on data-collection and communications. Minimum qualifications are: Master's degree in a computer-related discipline; at least two years supervisory experience, involving both computer operations and information systems development; background in research and statistical methods; broad-based knowledge of computer languages and equipment. Experience in academic environment is desirable. Salary range $14,000 to $17,000 commensurate with qualifications. Applications must be received by March 1, 1975. Send application with vita, transcripts, and three current references to **Dr. Elizabeth Daly, Chairperson of the Search Committee, Christopher Newport College of the College of William and Mary in Virginia, Post Office Box 6070, Newport News, Virginia 23606.** *An equal opportunity employer.*

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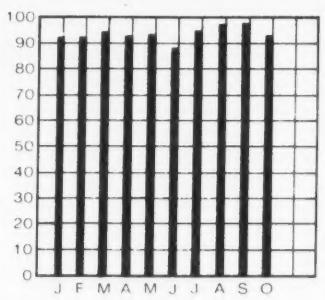

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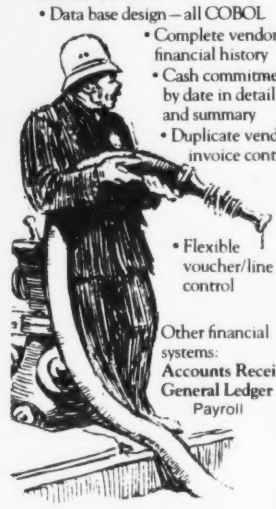

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MAI Marks First Plus Year Since '71

NEW YORK – Management Assistance, Inc. (MAI) reported record revenues and earnings for 1974 in a refreshing change of pace from losses since the last profitable year in 1971.

"MAI is definitely in a strong turnaround position. We now have four consecutive profitable quarters behind us, and all indications point to the continuation of this trend," said Raymond P. Kurshan, MAI president.

Earnings for the year totaled $2.8 million or 10 cents a share, including $1.8 million in tax credits, compared with a loss of $1.7 million or 10 cents a share in 1973, when there was $1.2 million in special credits.

Revenues reached $76.6 million compared with $66.7 million last year.

Equipment sales revenues were up, as were service fees, although rental revenues declined.

Equipment sales for the year rose to $35.3 million from $26 million in 1973. Of this, sales of the Basic/Four system accounted for $28.8 million in 1974 compared with $20.8 million a year ago.

Results are not entirely comparable because of a change in 1974 in the classification of credit for interest waived by lenders and inclusion in the consolidated statement of operations of revenues from the sale of older equipment subsequent to May 1973, Kurshan noted.

During the fourth quarter, earnings rose to almost $1.2 million or 4 cents a share, including a $633,000 tax credit, compared with a loss of $139,030 or 1 cent a share in the year-ago period when there was a $101,350 extraordinary credit.

Quarterly revenues totaled $20.8 million compared with nearly $19 million in the same 1973 period. Sales of Basic/Four equipment totaled nearly $8 million in the 1974 period compared with $5.4 million in the 1973 quarter.

Results for the year are subject to the collectability of $1.1 million receivable due from Potter Instrument Co. pursuant to a settlement agreement, Kurshan noted.

MAI's subsidiaries are Basic/Four, Sorbus, Genesis One and Vertex.

Six-Month MDS Losses Increase But Operating Income Rises 12%

UTICA, N.Y. – Although losses increased at Mohawk Data Sciences Corp. (MDS) for the six months compared with those of a year ago, "operating income, excluding charges relating to this consolidation program, actually improved by 12% over the same period last year," said V.E. Johnson, the company's president.

He added that results reflected the company's consolidation program and were consistent with MDS' objectives.

Revenues from continuing operations for the six months ended Oct. 31 climbed to $83,224 from $81,215 in the year-ago period.

Losses were $7.3 million or $1.18 a share, which included $653,000 or 11 cents a share from discontinued operations.

There was also a $1.2 million charge for expenses expected to be incurred in connection with the closing and relocation of a plant.

These losses compared with a debit of nearly $3.2 million or 50 cents a share last year, of which $177,000 stemmed from discontinued operations.

Record 2d Quarter Boosts Results Of Syncom's Half-Year Earnings

ORCHARD PARK, N.Y. – A record second quarter enabled Syncom, Inc. to show earnings for the six months ended Sept. 30.

The Computer Products Group recorded a strong jump in both sales and earnings as a result of "intensified marketing efforts and existing industry conditions," said Miles D. Bender, Syncom president.

During the second quarter, sales rose 49% to $702.7 million from $471.2 million in the same period last year. Earnings totaled $53.2 million or 3 cents a share compared with a loss of $20.4 million in the same 1973 quarter.

During the six months, sales reached a record of $1.3 million, up 35% over the $974,303 recorded for the year-ago period.

Earnings for the tape supplier reached $22.3 million, up from a loss of $6.9 million in the same 1973 six months.

Wyly Negotiates Loan for Datran

DALLAS – Wyly Corp. has negotiated a $10 million loan agreement with the First National Bank in Dallas and First National Bank of Boston.

Wyly needed the funds by Dec. 20 to secure a $10 million loan from Walter Haefner Holding AG of Zurich to finance its Data Transmission Co. (Datran) network [CW, Dec. 18].

The proposed bank loan will be secured by substantially all of Wyly's assets and the common stock and assets of its subsidiaries, Wyly said.

Availability of funds is subject to numerous conditions, including the ability of Wyly and its subsidiaries to meet certain financial ratios and tests and for Datran to meet specific revenue and performance milestones. Repayment will begin in 1976.

Earnings Reports

AMPEX
Three Months Ended Oct. 26

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Revenue	64,140,000	67,946,000
Tax Cred	656,000	212,000
Earnings	1,572,000	1,053,000
6 Mo Shr	1.35	.18
Revenue	129,641,000	131,096,000
Spec Cred	a19,166,000	490,000
Earnings	14,697,000	1,925,000

a-Includes pretax income of $13 million from IBM in settlement of anti-trust and patent litigation.

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Three Months Ended Sept. 27

	1974 (000)	a1973 (000)
bRevenue	$7,142	$6,688
Disc Op	d(11,750)	(1,061)
Spec Chg	.....	c322
Loss	11,805	.....
b9 Mo Rev	22,386	22,616
Disc Op	d(12,183)	(1,217)
Tax Cred	.....	39
Loss	11,991	517

a-Restated. b-From continuing operations. c-Operating loss carryover adjustment. d-Includes loss from disposal of discontinued operations of $10 million.

INTERNATIONAL VIDEO
Three Months Ended Oct. 26

	1974	1973
Shr Ernd	$.03	.....
Revenue	7,263,000	$6,377,000
Tax Cred	40,000	9,000
Earnings	83,000	21,000

KEYDATA
Three Months Ended Oct. 31

	1974	a1973
Shr Ernd	$.01	$.10
Revenue	3,154,000	2,872,000
Tax Cred	15,000	130,000
Earnings	34,000	271,000

a-Restated.

PRIME COMPUTER
Three Months Ended Sept. 30

	1974	1973
Revenue	$1,760,709	$390,470
Tax Cred	7,479	.....
Loss	139,295	473,169
9 Mo Rev	4,452,815	740,671
Tax Cred	42,164	.....
Loss	546,375	1,524,755

REDACTRON
Three Months Ended Sept. 30

	1974	1973
Shr Ernd	$.03	$.03
Revenue	4,944,613	3,339,548
Tax Cred	12,700	12,000
Earnings	36,509	34,646

VARIAN ASSOCIATES
Year Ended Sept. 30

	a1974	1973
Shr Ernd	$1.08	$.98
Revenue	293,005,000	241,290,000
Earnings	7,282,000	6,788,000
3 Mo Shr	.30	.29
Revenue	79,564,000	62,896,000
Earnings	2,031,000	1,925,000

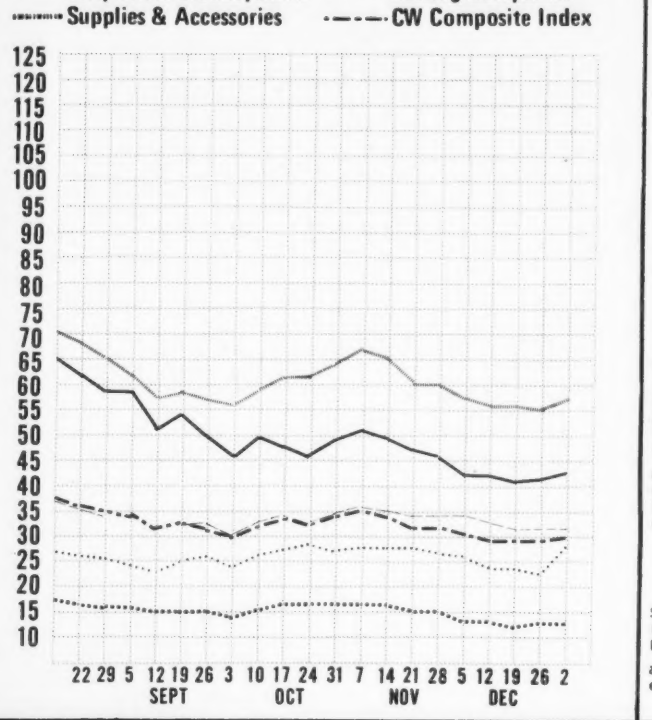
a-Reflects a change to the last-in, first out (Lifo) method of valuing U.S. inventories of the instrument and equipment groups.

WALLACE BUSINESS FORMS
Three Months Ended Oct. 31

	1974	a1973
Shr Ernd	$.52	$.39
Revenue	15,297,000	11,293,000
Earnings	961,000	703,000

a-Restated to the Lifo inventory accounting method.

COMPUTERWORLD Computer Stocks Trading Indexes



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TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1974 RANGE (1)	CLOSE JAN 2 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	63-217	74	- 3/4	-1.0
O	COMPUTER AUTOMATION	2- 14	2 3/8	+ 1/8	+5.5
N	CONTROL DATA CORP	10- 38	10 7/8	+ 3/4	+7.4
N	DATA GENERAL CORP	11- 38	14 1/8	0	0.0
O	DATAPOINT CORP	5- 15	5 3/4	- 1/4	-4.1
O	DIGITAL COMP CONTROL	1- 5	7/8	0	0.0
N	DIGITAL EQUIPMENT	47-121	47 1/4	-4 1/2	-8.6
N	ELECTRONIC ASSOC.	1- 3	1 3/8	+ 1/4	+22.2
A	ELECTRONIC ENGINEER.	4- 11	5	- 5/8	-11.1
N	FOXBORO	19- 48	23 1/2	0	0.0
O	GENERAL AUTOMATION	7- 40	8	- 3/8	-4.4
O	GRI COMPUTER CORP	1- 2	1/8	0	0.0
N	HEWLETT-PACKARD CO	54- 90	61 1/4	+1	+1.6
N	HONEYWELL INC	18- 86	21 3/4	+2	+10.1
N	IBM	152-251	168 7/8	+3 7/8	+2.3
O	INTERDATA INC	8- 22	13 1/8	-1 1/4	-8.6
O	MICRODATA CORP	1- 5	1 3/4	- 1/8	-6.6
N	NCR	14- 40	15 1/4	+ 3/8	+2.5
N	RAYTHEON CO	21- 39	25 1/2	0	0.0
N	SINGER CO	10- 40	12	+1	+9.0
N	SPERRY RAND	24- 44	28 3/8	+2 3/8	+9.1
A	SYSTEMS ENG. LABS	1- 3	1 1/8	+ 1/4	+28.5
N	TEXAS INSTRUMENTS	60-115	67 3/4	+1 1/4	+1.8
O	ULTIMACC SYSTEMS INC	1- 2	3/4	+ 1/8	+20.0
N	VARIAN ASSOCIATES	6- 13	7	+1 1/4	+21.7
N	WANG LABS.	7- 20	7 1/2	+ 7/8	+13.2
N	XEROX CORP	50-127	52	+1 3/8	+2.7
	LEASING COMPANIES				
O	BRESNAHAN COMP.	2- 2	2 1/8	0	0.0
O	COMDISCO INC	1- 7	3/4	0	0.0
A	COMMERCE GROUP CORP	2- 6	2 1/2	+ 1/8	+5.2
O	COMPUTER EXCHANGE	1- 1	3/8	+ 1/4	+200.0
A	COMPUTER INVSTRS GRP	0- 4	5/8	+ 1/8	+42.6
O	COMP. INSTALLATIONS	1- 1	1/4	0	0.0
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	3/8	+ 1/8	+50.0
N	DPF INC	2- 5	3	+ 1/4	+9.0
O	EDP RESOURCES	2- 3	3 1/4	0	0.0
A	GRANITE MGT	1- 3	5/8	- 1/8	-16.6
A	GREYHOUND COMPUTER	2- 6	1 7/8	+ 1/4	+15.3
A	ITEL	3- 6	3 3/8	+ 1/4	+8.0
N	LEASCO CORP	5- 12	5	0	0.0
O	LEASPAC CORP	0- 2	1/2	+ 1/8	+33.3
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 5	1	0	0.0
A	PIONEER TEX CORP	2- 10	2 1/4	0	0.0
A	ROCKWOOD COMPUTER	0- 1	3/8	+ 1/8	+39.9
N	U.S. LEASING	5- 24	9 7/8	+ 1/8	+1.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1974 RANGE (1)	CLOSE JAN 2 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1/2	- 1/8	-20.0
A	APPLIED DATA RES.	1- 3	1	- 1/8	-11.1
O	APPLIED LOGIC	1- 1	1/8	0	0.0
N	AUTOMATIC DATA PROC	21- 57	29 5/8	+3 5/8	+13.9
O	BRANDON APPLIED SYST	1- 1	1/8	- 1/8	-50.0
O	CENTRAL DATA SYSTEMS	4- 6	3	0	0.0
O	COMPUTER DIMENSIONS	1- 3	1 5/8	0	0.0
O	COMPUTER HORIZONS	1- 5	1/2	0	0.0
O	COMPUTER NETWORK	1- 2	1/2	0	0.0
N	COMPUTER SCIENCES	2- 4	1 7/8	+ 1/8	+7.1
O	COMPUTER TASK GROUP	1- 1	3/8	0	0.0
O	COMPUTER TECHNOLOGY	1- 1	1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 1/4	+ 1/4	+12.5
O	COMRESS	1- 1	1/8	0	0.0
O	COMSHARE	2- 4	2 5/8	- 1/8	-4.5
N	CORDURA CORP	1- 4	1 1/4	+ 1/4	+25.0
O	DATATAB	1- 3	7/8	- 1/8	-12.5
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	11- 25	12 7/8	+ 3/8	+3.0
O	INFONATIONAL INC	1- 2	3/8	0	0.0
O	I.O.A. DATA CORP	1- 1	1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1/2	0	0.0
O	KEANE ASSOCIATES	2- 4	1 3/4	0	0.0
O	KEYDATA CORP	1- 6	1 7/8	+ 1/8	+7.1
O	LOGICON	2- 5	3	+ 1/8	+4.3
A	MANAGEMENT DATA	1- 2	7/8	- 1/8	-12.5
O	NATIONAL CSS INC	5- 37	7 1/4	0	0.0
O	NATIONAL COMPUTER CO	1- 1	1/4	0	0.0
A	ON LINE SYSTEMS INC	9- 30	10 1/2	+1 3/8	+15.0
N	PLANNING RESEARCH	2- 3	2 1/8	+ 3/8	+21.4
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	1- 5	1 1/2	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	7/8	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1/4	- 1/4	-50.0
O	TCC INC	1- 1	1/8	0	0.0
O	TYMSHARE INC	6- 12	7 1/8	+1 1/8	+18.7
O	UNITED DATA CENTER	2- 4	3 1/4	+ 5/8	+23.8
A	URS SYSTEMS	2- 4	2 1/4	+ 5/8	+38.4
N	WYLY CORP	1- 5	2	+ 5/8	+45.4
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	3- 11	3 5/8	+ 1/4	+7.4
O	ADVANCED MEMORY SYS	1- 7	1 1/4	+ 1/8	+11.1
N	AMPEX CORP	2- 5	2 5/8	+ 3/8	+16.6
O	ANDERSON JACOBSON	1- 4	1 1/4	- 1/4	-16.6
O	BEEHIVE MEDICAL ELEC	1- 7	1 3/8	+ 1/8	+10.0
A	BOLT,BERANEK & NEW	5- 9	5 1/4	+ 1/2	+10.5
N	BUNKER-RAMO	3- 8	3 7/8	+ 5/8	+19.2
A	CALCOMP	4- 11	4	+ 1/8	+3.2
O	CAMBRIDGE MEMORIES	3- 16	3 1/8	+ 1/8	+4.1
O	CENTRONICS DATA COMP	7- 23	7 1/2	- 1/8	-1.6
O	CODEX CORP	8- 16	14	- 1/4	-1.7
O	COGNITRONICS	1- 2	3/8	0	0.0

EXCH		1974 RANGE (1)	CLOSE JAN 2 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER COMMUN.	1- 2	1/2	- 1/8	-20.0
A	COMPUTER EQUIPMENT	1- 2	1	0	0.0
O	COMPUTER MACHINERY	1- 5	1	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	5/8	- 1/8	-16.6
N	CONRAC CORP	10- 22	11 5/8	0	0.0
O	DATA ACCESS SYSTEMS	2- 3	2 1/2	0	0.0
O	DATA 100	4- 13	4 5/8	+ 1/8	+2.7
A	DATA PRODUCTS CORP	2- 4	2 1/8	- 1/8	-5.5
O	DATA RECOGNITION	1- 1	1/4	0	0.0
O	DATA TECHNOLOGY	2- 4	1 1/2	- 1/4	-14.2
O	DECISION DATA COMPUT	3- 13	5	+1	+25.0
O	DELTA DATA SYSTEMS	1- 2	3/8	- 1/8	-25.0
O	DIAN CONTROLS	1- 2	1/4	0	0.0
N	ELECTRONIC M & M	1- 4	1 1/8	0	0.0
O	FABRI-TEK	1- 3	3/4	+ 1/8	+20.0
O	GENERAL COMPUTER SYS	1- 4	1 3/4	0	0.0
N	GENERAL ELECTRIC	30- 65	33 3/4	+1 1/8	+3.4
N	HAZELTINE CORP	2- 7	2 3/8	- 1/8	-5.0
O	INFOREX INC	1- 5	1 5/8	+ 1/8	+8.3
O	INFORMATION DISPLAYS	1- 1	1/8	0	0.0
O	INFORMATION INTL INC	6- 14	7 1/2	+ 1/4	+3.4
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/8	0	0.0
N	MEMOREX	2- 5	1 1/2	- 1/8	-7.6
A	MILGO ELECTRONICS	6- 18	8 1/4	+ 1/4	+3.1
N	MOHAWK DATA SCI	1- 4	1 3/8	+ 1/4	+22.2
O	ODEC COMPUTER SYST.	1- 3	7/8	0	0.0
O	OPTICAL SCANNING	3- 6	7/8	-1 1/8	-56.2
O	PERTEC CORP	1- 6	1 5/8	+ 1/8	+8.3
A	POTTER INSTRUMENT	1- 5	1 3/4	0	0.0
O	PRECISION INST.	1- 3	1/2	0	0.0
O	QUANTOR CORP	2- 8	1 3/4	- 1/2	-22.2
O	RECOGNITION EQUIP	2- 5	2 1/4	+ 3/8	+20.0
N	SANDERS ASSOCIATES	2- 8	2 1/4	0	0.0
O	SCAN DATA	1- 2	1/2	0	0.0
O	STORAGE TECHNOLOGY	6- 15	6 1/8	- 3/8	-5.7
O	SYCOR INC	4- 13	4 3/4	+ 1/4	+5.5
O	TALLY CORP.	1- 4	7/8	- 1/8	-12.5
O	TEC INC	1- 7	1 1/4	0	0.0
N	TEKTRONIX INC	18- 48	19 7/8	+ 7/8	+4.6
N	TELEX	2- 4	2 5/8	+ 1/8	+5.0
O	WANGCO INC	3- 13	3 5/8	+ 3/8	+11.5
O	WILTEK INC	1- 8	1 1/4	+ 1/2	+66.6
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 6	4	- 1/4	-5.8
A	BARRY WRIGHT	4- 7	5 1/8	+1	+24.2
O	CYBERMATICS INC	1- 2	5/8	+ 1/8	+25.0
A	DATA DOCUMENTS	23- 54	28 3/4	+1 1/2	+5.5
O	DUPLEX PRODUCTS INC	6- 17	13	- 1/8	-0.9
N	ENNIS BUS. FORMS	4- 7	4 7/8	+ 1/8	+2.6
O	GRAHAM MAGNETICS	5- 11	6	+ 1/2	+9.0
O	GRAPHIC CONTROLS	6- 11	8 1/4	- 1/4	-2.9
N	3M COMPANY	45- 79	44 7/8	-2 7/8	-6.0
O	MOORE CORP LTD	33- 57	40 3/4	- 3/4	-1.8
N	NASHUA CORP	16- 45	19 7/8	+3 5/8	+22.3
O	REYNOLDS & REYNOLD	6- 35	9	+1 1/2	+20.0
O	STANDARD REGISTER	10- 16	11 1/4	+1	+9.7
O	TAB PRODUCTS CO	4- 11	4	0	0.0
N	UARCO	13- 23	16 5/8	+ 1/8	+0.7
A	WABASH MAGNETICS	3- 7	2 7/8	+ 1/4	+9.5
N	WALLACE BUS FORMS	14- 24	15 1/4	+ 5/8	+4.2

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Day 3 – The Human Interface: External Opportunities and Dangers for Data Communications Users.

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9:00- 9:45 Introduction and *Computerworld* Report
10:00-11:15 Workshops – Phase I
11:15-11:30 Coffee Break
11:30-12:45 Workshops Repeated
1:00- 2:00 Luncheon
2:15- 3:00 Wrap-Up Panel

SPECIAL AFTERNOON SESSIONS
3:15- 4:30 Daily (Open to all Caravan attendees)

EXPOSITION
First two days – 10:00 A.M. to 6:00 P.M.
Third day – 10:00 A.M. to 5:00 P.M.

COMPUTER CARAVAN 75

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Atlanta Feb. 24-26 (Mon., Tues., Wed.)
Exposition: Atlanta Merchandise Mart, 240 Peachtree Street NE.
Forum: Hyatt Regency Atlanta, 265 Peachtree Street NE.

Phila. March 4-6 (Tues., Wed., Thurs.)
Exposition and Forum: Philadelphia Civic Center (Center Exhibition Hall) Civic Center Blvd. at 34th Street.

Hartf'd Mar. 11-13 (Tues., Wed., Thurs.)
Exposition: (and all registration) Hartford Civic Center, 190 Trumbull Street.
Forum: Sheraton Hartford Hotel, 196 Trumbull Street.

N.Y. March 18-20 (Tues., Wed., Thurs.)
Exposition and Forum: New York Coliseum (4th Floor), Columbus Circle.

Clev. April 1-3 (Tues., Wed., Thurs.)
Exposition and Forum: Cleveland Convention Center, 1220 E. Sixth Street.

Chicago April 8-10 (Tues., Wed., Thurs.)
Exposition and Forum: McCormick Place, On-The-Lake

St. Paul April 15-17 (Tues., Wed., Thurs.)
Exposition and Forum: St. Paul Civic Center, I.A. O'Shaughnessy Plaza

Seattle (Tues., Wed., Thurs.) April 29-May 1
Exposition and Forum: Seattle Center, 305 Harrison Street.

San Fran. May 6-8 (Tues., Wed., Thurs.)
Exposition and Forum: Hyatt Regency San Francisco, 5 Embarcadero Center.

FORUM REGISTRATION FORM

Advance Registration is not required for the Exposition.

Send to:
FRANI BLACKLER
Computer Caravan/75
797 Washington Street
Newton, Mass. 02160
(617) 965-5800

Please copy this form to register additional people. Remember, there is a $15 discount for each 3 days registered. The same or different people may register – in any combination of days. If we receive more than one of these forms in the same envelope, we'll total up the number of forum days on all forms and take off $15 for each group of 3 days registered.

Register me for ☐ all three days ☐ 1st day ☐ 2nd day ☐ 3rd day

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☐ Atlanta	Feb. 24-26
☐ Philadelphia	Mar. 4-6
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Total number of days registered on this form _____
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Please circle one number in each category below.
(We must have this information to complete your registration.)

BUSINESS/INDUSTRY
10 Manufacturer of Computer or DP Hardware/ Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/ Consulting
40 Public Utility/Communication Systems/ Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government – Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other·

TITLE/OCCUPATION/FUNCTION
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/ Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other: